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Woodlawn Agricultural Society.

Measrs. Editors American Farmer :

The seventeenth anniversary of the Woodlawn Agricultural Society was held August 13th, at Woodlawn Mansion. The election of officers for the ensuing year and other routine business was attended to in a hurried manner in order to listen to addresses from several well known speakers. Henry C. Hallowell of Sandy Spring was the first speaker who entertained and instructed in his easy happy style.

Dr. M. P. Ellzey, of Washington addressed us on the subject of commercial manures. It was listened to with undivided attention by all who are interested in such matters. It was considered of such practical value that his manuscript was obtained for publication, and is forwarded herewith. Although vehement denunciations of the frauds practiced upon farmers by some manufacturers and their agents are not in the written address, yet there is enough of warning in it to caution the farmer in his purchases.

Gen. Fitzhugh Lee gave us the closing address, the desert of the feast, which it

produces the effect of the living orator.

The large numbers present on one of the most lovely days of the season appeared to enjoy themselves both physically and intellectually to the fullest extent.

N. W. P.

Address of Dr. W. G. Ellzey on Commercial Manures.

I shall make no apology for detaining you at some length, because the subjects I am to attempt to discuss are of vital importance to farmers. I hope to be understood as discussing the use of commercial manures as a part of a system of agriculture, not as a makeshift to obtain a great crop regardless of the cost of production and regardless of the condition in which the land may be left for the growth of future crops. If we grow paying crops and at the same time improve our land, we are farming scientifically, otherwise not. Combined nitrogen and phosphates are of all fertilizing materials most important, for they are at once the most costly and the most deficient, naturally, in our soils—nitrogen especially being also most subject to be leached out of the soil, and so completely and finally lost. Next in importance is potash and lime. In the first place, I invite attention to a few general facts and principles as a basis of mutual understanding as I proceed with the arguments I purpose to bring forward. The elementary constituents of plants are thirteen in number. Four of these substances are the common gases, oxygen, hydrogen, nitrogen and chlorine; five of them are metals, viz., potassium, sodium, calcium, magnesium and iron; four are metalloids, viz., silicon, phosphorus, sulphur and carbon. These thirteen elements are essential to agricultural plants, and substances consisting of varied combinations of them constitute plant food. Each and every one of these substances enjoys a practically universal dis-

tribution at the surface of the earth, as does also aluminum, the basis of clay, important to the physical texture of soils. No other substance does—a fact not explainable by evolution, hypothesis or nebular theory; a fact wonderful in itself, but not accounted for by any modern atheist or infidel.

Now please observe, that so far as is known, no plant can, under any circumstances, assimilate or utilize as a portion of any of its structure any one of the elements named in its full or uncombined states. I said, therefore, with a definite purpose, that plant food is composed of substances formed by divers combinations of the elementary substances named as entering into the composition of their structures. The nutrition of plants is accomplished by the decomposition of compound substances, mainly oxides, and the recombination of the elements thus set free into the tissues of plants by the physiological forces of the plant. This is an important general law. I invite your attention to it.

We have first chemical combinations of the elements according to chemical laws, forming the substances upon which plants feed, then the decomposition of these com-

their elements of physiological structures in accordance with physiological laws. The physiological forces are not merely a sort of physico-chemistry, as so often stated to be. They are capable of reversing both chemical and physical laws and subordinating them to the uses of living organisms.

If a plant be burned in the air, 95 per cent. of it will disappear in invisible gasses, diffused into the surrounding air; 5 per cent. of it will remain unburned, constituting the ash.

The combustible parts of plants are composed of four elements, viz., carbon, hydrogen and nitrogen. The ash is composed of nine elements, viz., potassium, sodium, calcium, magnesium, iron, silicon, chlorine, phosphorus and sulphur; these last are conveniently termed the ash minerals. The carbon, hydrogen and oxygen of plants are derived from the carbonic anhydride and water everywhere present in the air and in fertile soils in quantity superabundant for the uses of all agricultural plants. The nitrogen of plants is derived from nitric acid, possibly in part from ammonia. These substances exist also everywhere in the air and in soils, but not in quantities sufficient to supply the waste of constant cropping, as demonstrated by experience.

The ash minerals exist in all soils, as stated, but not, as frequently supposed, in inexhaustible supply. Experience, that great teacher, demonstrates that the phosphates are especially liable to be or to become, after continuous cropping, deficient for the full needs of our cereal crops. In like manner and in some soils, potash and lime are deficient.

It is true, as I have already stated, that phosphates and nitrogen compounds are the substances of chief importance in commercial manures. The phosphoric acid utilized by plants exists usually and mainly as phosphate of lime. It combines in several por-

tions with lime. One equivalent of acid combined with three of lime, forms the so-called tribasic or tricalcic or "bone phosphate of lime." This form is insoluble in water, and only when very finely pulverized soluble to any extent in solution of ammonium citrate. When finally ground, I have evidence that tricalcic phosphate is soluble in ammonium citrate, and when finely ground and properly mixed with kainit and other materials of that sort, it is largely and freely soluble in ammonium citrate. Combined with two equivalents of base, the phosphoric acid dissolves freely in ammonium citrate, and combined with one equivalent of base, the monocalcic form is soluble in water. Phosphates soluble in solution of ammonia citrate but not soluble in water, have been called "reverted" or "precipitated" phosphates. These terms are without any precise and definite scientific meaning; they are vague and elastic, and therefore misleading and capable of becoming the learned vehicle of much pious fraud. They have been undoubtedly extensively so employed. I know perfectly well what I am saying and am prepared to defend my positions. Inasmuch as all forms of phosphate acid eventually reach the form of tribasic combination in the soil and become insoluble in and immovable by soil water, inasmuch as the ashes and tissues of all plants contain only tribasic phosphates, it becomes perfectly clear that the importance of the constructions between soluble reverted and insoluble phosphates has been greatly exaggerated by chemists. Hence, I maintain and have long maintained that mechanical disintegration should be and can be substituted for chemical treatment in the preparation of crude mineral phosphates for fertilizing materials, seeing that chemical treatment is more expensive than mechanical in the proportion of \$130 to \$30. It can no longer be disputed that insoluble phosphates are assimilated by plants, the plants themselves effecting their solution and absorption by means of their roots placed in direct contact with the phosphate in the soil. I have not time to quote extensively from authorities, but I ask leave to read a statement from Sir John Bennett Lawes completely corroborative of that position which I have defended for many years. The pamphlet from which I quote, recently published, is styled "An Attempt to Explain the Action of Manures." On page 8, the learned author says: "In one of our permanent wheat fields at Rothamstead, the land receives, with other manures, 34 cwt. of superphosphate of lime per acre every year. This application has taken place every year for between 30 and 40 years, during which period hardly any phosphate has been carried away by the crops. A few years ago, several analysis of the drainage water passing through this soil, by Dr. Voelcker, showed less than 1 lb. of phosphoric acid to 100,000 gallons of water. A large crop of turnips would certainly evaporate this amount of water if not more, but as the turnips would require a good many pounds of phosphoric acid, it is evident that they could only get the required amount by some chemical action

of the roots when in direct contact with that substance." "It has been further shown," continues this pre-eminent authority, "by direct experiment, that polished phosphatic rocks can be corroded and roughened by the roots of plants in contact with them." I simply reaffirm that in the present state of knowledge no one can pretend that phosphates to be assimilated by plants must be soluble in either water or solution of ammonia citrate. What, indeed, have plants to do with ammonium citrate? As the result of the acceptance of the views stated above in many quarters, we have recently been furnished with ground phosphates reduced to an impalpable form called "floats," as the product of the mill invented by Mr. Duc, of South Carolina, and also ground by burrstones and bolted. Practical experiments with "floats" show that the phosphates in that form are readily assimilated by our crops. As the South Carolina phosphates are the best crude material for the production of "floats," I will, in the briefest manner, describe those vast deposits. The beds extend from the vicinity of Charleston, South Carolina, northward into North Carolina, and southward to Florida. Indeed, the northern limit of the formation is probably the New Jersey green sand; and valuable deposits will be found at intervals all along the coast, I have no doubt, when proper and competent search shall be made. Such exploration ought to be made by the United States Geological Survey. Of the aggregate amount of the material various estimates have been made, but it is certain that no sufficient data exist for reliable calculations. The pessimist view is that the accessible material will be exhausted at the present rate of consumption in from 10 to 20 years.

The optimist view is that the beds are "inexhaustible," the word inexhaustible conveying the idea of sufficiency for many years, to meet all the demands which can be made upon the accessible supply. With that interpretation of "inexhaustible," I am inclined to the optimist view. Professor Shepherd, whom I set down as a pessimist, says: "I should say that the total yield of all the phosphatic deposits of South Carolina of merchantable quality and accessible position, would not exceed five millions of tons." I have no doubt this is under the truth. I put it to you my friends that this material is now cheap; that if you get it once on your land it will remain there subject to no waste except future cropping. The future presents the certainty of a final rise in price, even though temporary depression may occur; act therefore in the living present. It is a safe, permanent investment on good terms as the case now stands; one year, five, ten, twenty-five years hence the case may be different. The phosphate beds occupy an area of 240,000 acres approximately, as already known and defined. Shepherd puts down the area which may be profitably worked at 10,000 acres only. It is hardly to be doubted this is too low an estimate, but I must add that Prof. Shepherd is an able man who has made his observations on the spot, and his conclusions are to be viewed in the light of those facts. It

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would be vain in this place to speculate upon the origin of these great beds. The material is obviously of animal origin, in many places composed in great part of fossil bones and teeth of great fishes and reptiles. How came these enormous multitudes of great beasts to die in those places in ages past it is not for man to know; it is for man to gather those bones together and manure his crops with them.

In some places the original form of these remains has been lost and they are now compacted into nodular beds, as it were compact stony floors, miles in extent, varying from 10 to 30 inches thick. The nodules vary in size from a few lines to several feet in diameter. The deposits extend under the river beds and even miles out at sea. That which is dredged up from the bottoms of public waters pays a royalty to the State of South Carolina of one dollar per ton. It is harder, denser, darker in color than the land rock.

The average analysis of these phosphates show from 55 per cent. to 61 per cent. bone phosphate of lime and 5 per cent. to 11 per cent. of carbonate of lime. Organic matter and combined water, and adherent moisture of each, 2 per cent. to 6 per cent. Sand and silica, 4 per cent. to 12 per cent.

The South Carolina phosphate is easily ground and bolted either in the Duc mill, which is a centrifugal apparatus, or between stones; in the latter case being bolted. The fineness of the product is the test of value, for just in proportion as it is fine will be the facility of its distribution in the soil and its assimilation by plants.

Mineral phosphates exist in other parts of the world, and in some places in vast supply. Very hard crystalline phosphates are called apatite, those less hard phosphorite. The Bordeaux phosphates of France are, according to the best information, practically worked out. The Spanish phosphates are of enormous extent and high grade, containing from 75 per cent. to 85 per cent. of bone phosphate. They are remote from transportation, and are hard to grind, but Duc's mill and other apparatus will probably get them into good form, and an inexpensive railroad will one day give them cheap transportation. The German phosphates are of increased importance since the chemical view of the non-assimilation of insoluble phosphates has to be abandoned. I hope and believe that the various European phosphates will soon be able to exclude the South Carolina deposits from all foreign markets and force their consumption at home. I should gladly hail the day when the last ton of them had been sent abroad. We want every pound of them here. Those of us who have already grey hairs upon us here and there, may yet see the day when there shall be one hundred millions of mouths to fill in this country. Already England, Germany and other European States do make and can make less food than they consume, and their populations are still increasing. The bread question is forging its way steadily to the front in humane affairs.

The Canada apatite is a rich phosphate, yielding an average analysis of nearly 75 per cent. bone phosphate. It contains fluoride of calcium, and cannot be treated with sulphuric acid without free evolution of hydrofluoric acid, a poisonous, suffocating corrosive, and dangerous gas. It may prove of value for "floats," and, under a good demand, it may come to yield 50,000 tons per annum to commerce.

Phosphatic guanos are found in divers places. Some of these are pulverulent in form, some are hardened into stone. All of them have lost nearly the whole of the organic matter and ammoniated salts by leaching rains. They retain the insoluble phosphate mixed with more or less carbonate of lime, silica sand and other substances of no value. The super-phosphates made from this class of guanos have a tendency to re-

main in a soft, pasty condition, and they do not suit manipulators. They ought to be applied to the land without the sulphuric acid treatment. The success of the so-called Orchilla guano so applied is a fact that stands out against the theory that the use of sulphuric acid is necessary. It is difficult to obtain exact data about these deposits out along the South American west coast are certainly extensive beds of this kind. In the West Indies are rock guanos of great extent, some of them containing so much phosphate of iron and alumina as to be of little use for super-phosphate, such as Navassa and Rodondo rocks. It remains to be seen how they will act when floated, and especially when mixed with kainit, lime, etc. I look confidently to the abandonment of sulphuric acid in the manufacture of fertilizers for general agriculture.

Super-phosphates may continue to be manufactured on a small scale for special purposes. I believe they will be, I know they ought to be, abandoned by the general farmer. No crop grown either does or can, in my belief, pay for their use. I have examined into the matter from every possible point of view, I am familiar with the chemistry of the subject, and I am perfectly convinced that the long continued and extensive use of either super-phosphates or the so-called ammoniated super-phosphates alone will ruin any farmer. Raw ground bones I believe to be the only fertilizer which used by itself has produced paying crops and improved the land. Those who have used raw bone and fed much stock have made money and rapidly increased the value of their lands. Those who have used super-phosphates and ammoniated super-phosphates and tried to make money by selling corn and wheat and tobacco, are mostly insolvent, and their impoverished lands have been hawked off at auction by the sheriff for a song. Sir John Bennett Lawes compares the treatment of phosphates with sulphuric acid for turnips to cooking soup for a hurried and hungry traveller. Now, I say taking that view of the case, the cook's hire is too high. It will break us all up to feed any crop we can grow here on that sort of soup. It will cost us \$100 to cook \$30 worth of Lawes' phosphate soup. The soup may be good, but who is able to pay the price? I take my stand upon this proposition: we must dispense here with sulphuric acid in the preparation of phosphates for our crops and our lands, or we shall all go to the wall.

How the case may stand in England or elsewhere I know not, but I do know that no system of farming here will justify the expense of super-phosphates, ammoniated or not, as a main reliance for the production of paying crops and the improvement of the land. For phosphates, we must rely upon bones and floats; for nitrogen, upon green crops and animal manures as the basis of any system of farming by which we hope to make a living and improve our lands, and if we cannot hope to do that, why farm at all, seeing that ultimate bankruptcy stares us in the face. Must we toil on forever to no purpose, and dying, leave our children in want, while that which was ours by inheritance passes to the children of the manufacturer of sulphuric acid? Things have been going that way at a great rate hitherto. It is high time to turn back. Let us compare the floats and other insoluble phosphates. Orchilla guano contains the phosphate in the same form as the floats. It contains 43 per cent. of it, the floats contain 60 per cent. of it. Orchilla costs \$30 per ton, floats cost \$18. A ton of Orchilla super-phosphate costs \$75 or near it. The phosphate in the Orchilla and the floats is in the same form as in raw bones, and in the old Peruvian guano, in dried blood, in fish scrap, in wood ashes, in green crops and farm-yard manure. Do I say too much to you farmers when I say that is a good form?

About potash, I have only to say that on

stiff feldspathic clays it can be but carrying coals to New Castle to put potash. On all light, sandy, magnesian and chaffy land it will pay to put potash. I recommend you to try a mixture of two-thirds floats and one-third kainit, apply at the rate of four hundred pounds per acre broadcast on the rough and harrow in as a preparation for wheat. If practicable, apply that mixture in April or May to a fallow crop, clover or peas, to be turned under in September for wheat to be seeded by from the 10th to the 20th of October. If the wheat does not show well by the last of March, top dress with 100 lbs. per acre of nitrate of soda. On your corn, apply 400 to 500 lbs. per acre of phosphates and kainit mixture, per acre broadcast on the rough and harrow in. Follow the corn with wheat or oats and top dress during winter with stable manure. In spring, seed to grass and dress with 100 lbs. per acre of nitrate of soda. On fallow wheat land it will be a good plan to apply at least every other time in rotation, besides the phosphate-kainit mixture, 25 bushels per acre air-slacked lime, scattered on the rough and harrowed in. I put some lime on new land, near Fairfax Courthouse, and doubled the yield of corn. Your lands in this county are deficient in lime.

As to nitrogen, I must condense all I have to offer into a few pages. I have said that crops get their nitrogen mostly from nitric acid; that fact is certain. Ammoniated salts cannot long exist in the soil as such; they undergo rapid conversion into nitric acid and other products. So does the nitrogen of organic matter move slowly. This is accomplished by the agency of the nitric ferment. The nitric ferment is a microscopic vegetation, subterranean in its habitat, classed with the yeast plant, and producing as the result of its assimilative activity nitric acid. It converts all forms of combined nitrogen into nitric acid, but more speedily converts the ammonia salts than organic compounds or nitrogen combined with carbon. Neither the ammonia salts nor the nitrogen of organic matter suffers any waste by leaching, but nitric acid does leach out rapidly and soon appears in the drainage water, combined with lime or other basic matter. I mean by basic matter, substances capable of combining with an acid to form a salt. It thus happens that the nitric acid appears in the drainage in the form of nitrates, so not only wasting itself, but becoming the vehicle of an important part of the ash minerals of the soil and deporting them also. It is exceedingly important, therefore, to understand fully the history of combined nitrogen in the soil. The laws which govern the activity of the nitric ferment are very well known. When the temperature declines 40° F. it ceases to act, as it does also when on the other hand the temperature rises above 140° F. It is most active at 99° F. and its activity declines somewhat rapidly as the temperature rises above or falls below 99°. In a full strong light, with free access of oxygen, its activity is much impaired or altogether destroyed, hence its subterranean habitat. The functions of the nitric ferment in nature is to transfer the nitrogen of organic matter from its insoluble combination with carbon to a combination with oxygen, forming nitric acid, soluble and assimilable by plants, whereas the same decline of temperature which at the approach of winter arrests the growth of crops, arrests also the formation of nitric acid, and the waste which would otherwise occur is thus prevented.

I have already stated that the nitric ferment likewise transfers the nitrogen of ammonia salts from its combination with hydrogen to oxygen, forming nitric acid. Here then we come upon one of the most beautiful and important of the great series of checks and balances upon which the perpetuity of the universe depends. If we apply nitrogen to our fall-sown grain in the form of nitrates, as nitrogen of soda, the plants will take up

only a very small portion of it before the frosts of winter check their growth, but during the winter washing rains and melting snows will carry a very great portion of the residue of the nitrates into the drainage water and it will be lost. In this way, beyond dispute, millions of dollars have been lost by farmers. Nitrogen is cheaper in sodium nitrate than in other commercial forms, hence that substance has been largely used to "fortify" the analysis of so-called ammoniated super-phosphates as "wheat manures" of the various manufacturers which are universally applied in the fall, and often late in the fall at the very verge of winter, a practice wasteful and ruinous. Now those chemical analysis, which are to protect the farmers, report this nitric acid as ammonia, or as nitrogen-yielding ammonia. The farmer pays 30 cents a pound for it, and then casts it into the ditch water and sees or hears of it never again. This is the law: put no nitrates on fall-sown crops; top-dress with them in the spring, the latter half of April in this locality. When we reflect upon the fact that the wheat crop matures within six weeks after the nitric ferment begins to be active, we should have no difficulty in comprehending why this crop needs such large artificial supplies of nitrogen. Whereas corn, cotton and tobacco cover in the period of their vegetative activity the whole period of the activity of the nitric ferment, including July, August and September, its period of greatest activity; therefore, we do not wonder that corn, cotton, tobacco, clover, etc., do not need artificial supplies of nitrogen, and, as a matter of fact, experience demonstrates that they are little benefited by any nitrogenous manure. Nitrogen purchased at 30 cents per pound to apply to a crop not benefited by it is a costly waste, because a great part of it will be lost before the land is occupied by a crop which can utilize it. It may be stated as a rule that nitrates and salts of ammonia are either taken up by vegetation or lost in the drainage water in one season after their application to the soil. Therefore, they are of little benefit to any crop which comes after that one in the rotation to which they are applied. In the light of this fact we comprehend why no improvement but often material damage to poor land results from empirical use of Peruvian guano. It is proven that the most economical way to feed any animal is to supply it with the optimum of food in kind and quantity every day of its life, from birth to slaughter; that the same law holds good of agricultural plants there can be no doubt. We cannot house our crops nor control the seasons, but we can control their food supply and protect them from the plundering of hostile weeds invading their commissariat.

It is in vain that we supply our plants with an overplus of phosphates, potash and other ash minerals when the supply of nitrogen is insufficient. The idea that plants obtain nitrogen from the air by assimilating it directly in its free state is a fatally disastrous error, erroneous in theory and pernicious in practice. It is only combined nitrogen, such as is furnished in manures, which is plant food. Twelve or thirteen bushels of wheat is probably the limit of the capacity of production of our soils supplied with an overplus of ash minerals without artificial supplies of nitrogen. The ash minerals present in that supply which constitutes the optimum or best quantity for the crop, then if nitrogen be present also in the best forms and in such quantity as represents also the optimum or that which is best for the crop, then our soils and seasons seem capable of yielding from forty to sixty bushels of wheat per acre. Now if we have the optimum of nitrogen and less than the optimum of ash minerals, remember that the nitrogen cannot be taken up for lack of ash minerals, and that we shall suffer great loss from its rapid waste. But ash minerals will not thus waste (except lime as sulphate), and we may accu-

mulate a permanent excess of them in the soil ready for future crops. It is in view of this fact I earnestly press it upon you to accumulate as large a supply of phosphates and potash as possible in your soils while these articles are now cheap. But I warn you against the heavy application of nitrogenous manures to soils in which there is less than the optimum of potash, phosphates and other ash minerals. In so doing you are subject, I say, to various losses from the leaching and permanent waste and loss of that costly substance, nitric acid.

The use of one sided manures is necessarily bad practice which can only in any case accomplish a temporary purpose at the expense of the soil. Let us resolve to abandon now and forever the makeshift, rip-goose system. Let us resolve here and now that we will understand our business as a science, that we may practice it skillfully as an art, and we may rely upon it that the Great God of heaven and earth will continue to send his rain upon the just and the unjust, and that seed time and harvest shall never fail.

Frederick County, Maryland.

Messrs. Editors American Farmer:

In looking over some old papers I came across the following article from the pen of the late Dr. Philip Tyson, State Geologist, on the Agricultural Geology of Frederick county, written in 1858. Though twenty-five years old, it will doubtless be interesting to many of your subscribers in that rich and highly favored county, and serve to convey to strangers a better idea of the wealth and resources of the State.

Dr. Tyson was a most intelligent scientist, and a diligent and painstaking investigator, who was not appreciated in his day and generation, and I fear much of his work has been lost. At the instance of the late Evan T. Ellicott, also one of Maryland's most useful and intelligent citizens, I made an effort in the Legislature of 1862-3 to rescue from oblivion a part of Dr. Tyson's work, but the overshadowing events of the war pushed out of the way everything like scientific research and industrial improvement, and I am not aware that any steps have since been taken to bring to light the many rich and interesting treasures contained in Dr. Tyson's notes and laboratory.

The article I send you may prompt some of the young professors of the Johns Hopkins, who have already rendered valuable service in Maryland history, to extend their investigations into Maryland's resources.

The papers of Dr. Tyson, an old friend and cotemporary of their patron and founder, Mr. Hopkins, would I am sure, render very valuable aid and assistance.

Yours truly, A. B. DAVIS.
Greenwood, August 10, 1883.

Frederick county contains a larger area of cultivated land whose average fertility is greater than any other county in Maryland. The causes of this fertility are well worth a careful investigation. A full knowledge of all the circumstances connected with this interesting subject would fully satisfy our inquiries and indicate the various means by which the products of the soil even of this wealthy county might be materially increased in amount.

It is impossible properly to investigate the causes of the superiority of the lands of this or any other county without a full knowledge of its mineral constitution. This can only be obtained by a detailed geological survey, executed in such a manner as to indicate the chemical and physical characters, and extents of all its rocks or mineral masses at or near the surface. This is evident from the fact that all soils mainly consist of earthy matters, resulting from the disintegration and decomposition of rocky masses.

In order to avoid technical details, it may

be remarked generally that rocks are slowly but incessantly acted upon by the elements of water and the gases which constitute our atmosphere, aided by alternations of temperature. The various chemical and physical actions which ensue, disintegrate and decompose the rocks and bring them at and near the surface to the state of what we call soil, earth, loam, etc. Some of their constituents (as carbonate of lime for instance) are dissolved and washed into the adjacent streams of water, or percolate into the ground to mingle with underground streams. It is owing to this cause that there is no spring, river or well water that does not contain mineral substances in solution. The more insoluble remain and constitute what we call "soil in places."

In localities, over which floods have swept, portions of the soil have been washed off and deposited in places more or less distant, and when elevated above the water level are called alluvial or "transported soils."

Except some points on the margins of water courses, the soils of Frederick county are of the first kind, or "in places." Their characters, therefore, depend upon the chemical and physical constitution of the rocks upon which they rest and from which they were formed.

Omitting those rocks and minerals which are known to exist in extensive areas within the limits of Frederick county. Instead of stating their entire chemical composition, our present purpose will be better answered by a description of such of their constituents as assist in forming the inorganic matter of plants, or the ashes remaining after they have been burned:

1. Talcoose slates and argillites or clay slates, which contain the silicates of lime, potash and soda, besides iron phosphoric acid and sulphur; the last being usually confined with iron, forming the iron pyrites so often mistaken for gold.

2. Limestone, which, if perfectly pure, would be incessantly dissolved and carried off by water and the carbonic acid of the atmosphere so as to leave no soil on the rock. There are, however, in limestone various foreign matters, sometimes in such quantity as to constitute a considerable proportion of the rock; these being for the most part insoluble in water, remain behind and constitute the soil. The limestone rocks, with their impurities, usually contain the same substances required by plants that are found in the slates as above stated. Phosphoric acid is often found in larger proportion than in the slates.

3. Hornblend and other trap rocks, which furnish the soil with abundant supplies of the silicates of lime, iron, magnesia, potash and soda, besides phosphoric acid and frequently chlorine.

4. Epidote, which contains from 12 to 16 per cent. of lime, combined with silica.

5. Chlorite, which is variable in composition, but usually contain potash and always iron.

6. Hard, white sandstone.

7. Red sandstone. [Both these sandstones are almost wholly composed of grains of quartz and furnish little of use to plants].

8. Red shales, some of which contain notable proportions of carbonate of lime, in addition to the constituents before named in the slates, (1).

It is much to be regretted that the geographical distribution of these rocks cannot be accurately given, for want of a complete geological map. We must, therefore, content ourselves for the present with a brief notice of their extent and positions.

Eastward of the Monocacy, the prevailing rocks are the slates (No. 1), some of whose layers are more or less calcareous. There are also numerous isolated localities of limestone, some of which are extensive. They add much to the fertility of that fine portion of the county.

A wide belt of limestone stretches from the Potomac on the western side of the Monocacy for more than 20 miles N.N.W. Between Israel's creek and Woodsboro, it underlies a fine region on the east side of the Monocacy.

North of this limestone the valley is mainly covered with redshales, more or less calcareous. A portion of it, however, is occupied with a fine-grained red sandstone, and near the northern boundary line we have the Potomac marble or brexia. These shales also form a belt succeeding the limestone on the western side of the valley to the Potomac. They again are succeeded by the Potomac marble which courses their western limits. This variety of limestone is well exposed on the turnpike to Hagerstown, on the B. & O. R. R., and on the C. & O. Canal, below the Point of Rocks.

Along the foot of the Catoctin Mountain there are heavy beds of slates much concealed by rocks and stones that have come from the mountain sides.

A variety of rocks exist in the Catoctin Mountain, but we are without the requisite knowledge to describe their relative positions.

A hard white sandstone covers portions of the summit, whilst the larger portion of the ridge consists of epidote, slates, chlorite, amygdoloid and porphyry. Serpentine or magnesian rock, occurs west of Emmitsburg, and a verde antique marble is found in its vicinity. These rocks, abounding with the elements of fertility, produce very rich land of great value when not covered with the debris from the summit sandstones. The fine region called Harbaugh's Valley owes its fertile soil to the rocks of the Catoctin Mountain.

The Hornblend and trap rocks occur in dykes and isolated masses in divers parts of the valley of the Monocacy and in the Catoctin Mountain. They add to the fertility of the soil by their decomposition.

Middletown Valley lying immediately west of the Catoctin Mountain may be truly called one of the garden spots of Maryland. Its fertile soil is derived from the slates, the epidote, amygdoloid and other rocks containing ample stores of the mineral matters required by plants. The only occurrence of limestone in this valley, we believe, is of very limited extent near the Potomac, but the rocks before named contain ample stores of silicate of lime.

The South Mountain, whose summit forms the western limits of the county, is so much covered with the debris from the heavy beds of white and gray sandstones which constitute its upper portion that it is difficult to make out its geological structure.

Opposite Harper's Ferry, where the railroad and canal are cut along its base, the rocks are mainly quartz containing tale, felspar and mica. Upon these, there seem to be heavy beds of slate again underlying the sandstone of the summit.

Having given this brief sketch of the geological structure of Frederick county, (very imperfect, for want of the facts that a detailed survey would furnish,) it remains to be stated that it is almost entirely made up of precisely such kinds of rocks that abound with those mineral substances required to form the most fertile soils.

Leaving out the sandstones, whose aggregate area is but little, we find the rocks of Frederick county of such kinds that (excepting the limestone), if we were to pulverize portions of each and expose them to air and moisture for a year or two, we should have a fertile soil.

So far we have made no reference to the organic matters so useful in vegetation. These are produced from the decayed remains of the plants and animals which lived and died on and in the soil. If, as is the case in this county, there be an ample supply of the mineral matters, in the proper state to be taken up by the plants, they will soon

take root, and when they as well as the numerous insects and other animals that feed on them, die and decay, they form the organic matters of the soil usually called "vegetable mould."

Although our knowledge of the geology of Frederick county is very imperfect, enough of it is known to enable us to indicate with sufficient certainty the causes of the superior fertility of the soils of this highly-favored part of Maryland.

It so happens that nearly all the rocks of the county are precisely those which are richest in those mineral matters required by plants. Two of these elements are, however, not in full supply—sulphur and chlorine—but they can be cheaply and readily introduced by using small quantities of gypsum and common salt.

Most of these rocks do not exist in other counties. Carroll contains a portion of the red shales and the slates. There are slates in other counties, but they differ in their chemical compositions from most of those in Frederick.

Although the aggregate of the products of the soil in Frederick seems large when we take into account the large area of improved land as given by the census returns 1850, we are forced to admit that it is far, very far, beneath what it should be. There is certainly great room for improvement in the agriculture, even of that county. It is by no means extravagant to assert that if proper systems of culture and management were adopted and energetically pursued, but few years would be required to double the aggregate amount of agricultural production in this county, to which providence has been so bountiful.

There are various minerals of great industrial value in this county, but as they have no direct relation to the subject in hand they need not be adverted to at this time.

Topics from Abroad.

From our Correspondent in Paris, August 11.

SHEEP MANAGEMENT IN HUNGARY.—Hungary is the most important wool-growing country in Europe, and it has many points in sheep farming meriting to be studied. In the matter of shearing, the wool is washed before being clipped. In the case of lambs, the opposite is the plan. Buyers of wool are less liable to deception when thus purchasing the washed clip, and there is less waste. Economy is also effected in the transportation. Packing wool in its grease is considered to entail loss in weight and quality.

The water preferred for washing ought to be exempt from iron, which blues the wool; neither ought it to be calcareous, as that would produce an insoluble salt of lime when mixing with the soapwort plant, (*Saponaria Officinalis*), having the inconvenience of remaining incrusting on the wool and difficult to be removed. Rain water suits best, or that which can be softened by neutralizing agents. The water ought to have a temperature sufficient to act on the greasy matters, but not too low to render the workmen uncomfortable, who have to remain up to their waists in the vats. In Hungary the washing is effected partly in cold and partly in warm water thus: Two canals or runs, 70 feet long and 6½ wide and deep, having their intervening space fitted up with six vats or reservoirs, each capable of accommodating four sheep. A steam engine supplies the warm water.

The sheep are run into canal No. 1, to be steeped, washed in the vats containing the heated water and the soapwort preparation, and rinsed in canal No. 2. After being well dipped, the sheep are allowed to remain, if in evening, over night, or if in day time, three hours under a shed; a second dip ensues, next half an hour's rest, and then the animals pass to the vat. In the latter

are two men, who commence by washing respectively the head, neck, back, sides, belly, and last, the legs. The sheep pass into the second canal and are played upon by jets of water.

The sheep are allowed three days to dry, being kept in a sheltered situation to avoid dust; the drying ought not to be too rapid or in other words, forced, as that makes the end of the staple brittle and hard. The soapwort plant is common to Hungary; 336 lbs. of the soapwort, previously cut into morsels, and boiled in 700 gallons of water, suffice to wash 1,400 animals; the same water washes 75 sheep, and is changed every hour and a-half. Soapwort is a very general plant in the light lands of Hungary, especially in humid districts. About 80 persons will wash 1,400 sheep in twelve hours, at a cost of 330f. per day, or about some 5 sous per head.

Women shear sheep, and are paid 2½ sous per sheep; double this rate for rams; 18 to 20 animals can be shorn in a day, of 12 hours, and any animal injured or badly clipped, is not paid for. Women again separate the yellow from the white wool; next it is classed in classes, ewe, ram, wether, etc., and packed in bales of 113 to 140 lbs., fetching about 5½ to 6 francs per lb. Buyers admit about 11 to 15 per cent of yellow, in the white clip. The breed of sheep preferred is the *negretti*, a variety of merino; it is not precocious; a mixture of Southdown blood would be advantageous.

ENSILAGE.—The National Society of Agriculture has presented M. Goffard with an *objet d'art*, for the great services he has conferred on agriculture generally, by his plan of ensilage. He has just brought out a new edition of his manual, which contains some new facts and points out errors to be avoided. The final results of his ripe experience is this, for maize, give the *siles* or trenches, an elliptical shape; build in masonry, perfectly air and water tight, free from angles and profoundly embedded in the soil; cut the maize before emptying into silo; press it energetically and continuously during the whole period of preservation. It will keep thus perfectly for seven months, turning out an agreeable, yellow, and palatable mass, having no musty, greenish borders, such as result when in imperfectly constructed trenches.

HELPING COLTS.—The addition of either pure phosphate of lime, or that salt in the form of calcined bones, has proved very beneficial in the rearing of colts, developing most happily the points of the animal. The phosphate, half an ounce, is given in the form of a mash; this over a quart of oats is poured in boiling water, then one pint of bran to absorb the latter; allow the mass to swell, and when cool, add the phosphate. Chopped hay or straw can replace the bran.

DIGESTIBILITY OF RATIONS.—M. Kuhn, of the experimental farm of Mockern, Germany, has since 1877 been occupied in a series of experiments on the comparative digestibility of rations in a natural or prepared state. The moistening of meadow hay with water, or with bran-water, effects no advantage in point of digestion. He has found, that pouring boiling water on bran, and allowing it to steep thus during 24 hours, positively retards digestion of the constituent elements of the bran. It is a matter of indifference whether the bran be given in the form of a drink or alone, or mixed with chopped hay. It would result then, that neither the steaming of food nor its preliminary fermentation, contributes to the digestibility of the rations. Opinion will differ over these conclusions. All are agreed on this point, that when food is taken into the system at a higher temperature than that of the body, digestion is interfered with.

THE more nature is sad, the more the hearth stone is dear.

Neatness on the Farm.

The Deer Creek Farmers' Club met on Saturday at "Dunleith," the residence of Mr. Thos. A. Hays, near Churchville.

The club in a body accompanied the committee, Messrs. Archer, B. Silver, Jr., and Munnikhuyzen, over the premises and through the buildings. Mr. Hays' residence is a large, old-fashioned stone house, built by his great-grand-father, Archer Hays, in 1808, as appears by a tablet in the front wall, which bears the date and the initials "A. & H."—Archer and Hannah Hays, his wife. A bed of coleus in the lawn, containing a great many distinct varieties, many of them rare and beautiful, attracted attention. Mr. Hays was experimenting in the use of nitroglycerine for the removal of stumps. Two blasts were discharged in the presence of the club, but were not successful in throwing the stumps out.

The committee reported, through Mr. Archer, who said that since Mr. Hays was opposed to whitewashing reports he would inquire why his plowman skipped so many places. Mr. Hays said this was only on one part of the field, and was the fault of the colored plowman.

Mr. Archer did not think any farm in this section has been improved as much as Mr. Hays' since he has had the management of it, whether the improvements have been economically made or not is debatable. His buildings are in good shape and there are plenty of them; his stock cattle, hogs and young cattle—thorough bred and grade Short Horns—look well. His horse stable is the best he ever saw. The shed in front is a good thing. He deserves credit for the manner in which he has kept his place up. He has a beautiful osage orange hedge which he is now engaged in trimming.

In reply to the question when such hedges should be trimmed Mr. Hays said they could be trimmed any time in the year. The oftener the better.

Mr. Silver thought it a good plan to have the horse stable separate from the barn. Considerable risk from fire is avoided thereby when wagons come home with their teams late at night and use lanterns.

Mr. Munnikhuyzen said Mr. Hays kept his implements well housed, and he thought it less expensive to keep up a roof than to replace farming implements every few years.

Mr. Webster thought the appearance of Mr. Hays' farm would greatly overbalance any little criticisms the club could make.

Mr. George E. Silver said Mr. Hays' garden should have been noticed. There is not a weed in it; and Mr. Moores spoke of Mr. Hays' fine Berkshire hogs.

Mr. Webster deprecated the custom of farmers throwing weeds into the public roads. The seeds are washed into the streams and scattered through the fields. Mr. Munnikhuyzen said wagon wheels also pick up weed seeds with the mud of the road and carry them great distances.

The subject for discussion was: "Does neatness on the farm and its surroundings pay the farmer?" We are indebted to the *Agis* for our report.

Mr. Hays said it always does. In every rural neighborhood the most prosperous farmers are those who keep their places neat, buildings painted or washed, fences and roads in good repair, and their fields free from weeds and rubbish. It may be said that men with plenty of money can afford to spend it for show, but this is not the full explanation of this coincidence of facts. Men who make money in farming are least inclined to pay it out merely for show, and it may be safely put down that all work done by the thrifty farmer is in the direction of profit. Hence as neatness commonly goes with thrift, it is quite as likely one of its causes as one of its effects. Habits of neatness are not too common, and in every

business the men who do their work in the neatest and most thorough manner get the best pay. The farmer who grows his crops among weeds can never sell his grain at the highest market price, while the little extra care required to grow and keep crops clean always pays well. A man who grows pure seed of any kind will find a demand for his entire crop at prices enough higher than the market rates to make a good profit for his care. Growing seeds and garden vegetables is nearly always remunerative, because they cannot be successfully grown without close attention to details and neatness. It pays a farmer to have an eye to his line fences, his own and neighboring roads, keeping them well drained, smooth and free of stones. Let us have good roads, neat farms, and we will have good neighbors and a prosperous, thrifty section.

D. E. Wilson had no doubt it paid if not carried to an extreme. Fancy ideas of neatness may not pay, but everything ought to be kept in as neat order as practicable. Weeds ought to be destroyed and farmers should use only the best seed, raising it themselves.

R. Harris Archer said a certain degree of neatness should be observed. In fences the most economical should be put up, regardless of appearance. If a man has plenty of chestnut the worm fence is the cheapest but does not look as well as others. In some sections hedges are the neatest, but he would not advise their use where rails are plentiful. He thought there was a great deal of time wasted in the effort to get rows of wheat cutting perfectly straight. The same in cutting up corn. Mr. Hays' gates are neat, but he thought there was no necessity for more than one large post, to which the gate is swung; the other could be light, and expense saved thereby. He concluded, however, that there was more likelihood of neatness being underdone than overdone.

Benj. Silver, Jr., thought neatness desirable in everything, but did not think it paid to carry it too far. It seemed to be every man's aim to make money, and the man who spends his money in making his farm neat and attractive deserves as much credit as one who succeeds in accumulating money by his labor. A post and rail fence may be out of shape and a new one would look better, but if a stake here and there would make it last longer and answer the purpose it would not pay to put a new one. Keep bushes down and make your place look as neatly as you can. Neatness is not overdone generally, and as a rule it pays.

Geo. E. Silver was of the opinion it paid the farmer to be neat, to keep his fence rows clean, and briars and bushes cut down. Even a worm fence may be put up neatly. Neatness around the dwelling is also desirable. It makes home attractive, excites self-respect, energy and ambition. Harford county is rapidly improving in respect of neatness. Fences are put up in better style, fence rows kept cleaner, houses are white-washed or painted—all adding to the general improvement of the county. If a man has money to spend it might pay him to be what might be termed "over neat."

Wm. Munnikhuyzen said it decidedly pays to be neat, not only in our surroundings but in putting in and gathering crops. Slovenly work denotes bad farming. Neatness may be carried to an extreme, but it is seldom done. He had traveled through other States and had seen no section that can compare in neatness to Harford.

R. John Rogers was in favor of neatness, and like others of preaching what he did not practice. Wherever you find a man particularly neat and careful in farming you are likely to find him neat and careful about everything. A man can educate himself in habits of neatness. When fence rows are cleaned the refuse should be hauled away and deposited in some wash or other place.

It pays to have neat substantial gates instead of bars. No reasonable amount of labor should be spared in putting in crops. It was supposed that oats require little care in planting. He had found it paid to prepare the ground thoroughly, harrow it well and drill them in. Anything spent about our homes to make them neater, more desirable and comfortable is money well invested.

Jas. Lee said that in selecting a tenant he would take one he knew to be neat in farming. His practice is to begin to cut down bushes the day after the last load of hay is hauled in. He remembered when it took several weeks to cut down bushes on his farm, now it can be done in a few days.

John Moores said he liked to see neatness, but there is a happy medium to be observed. Neat farming is sometimes too costly. It should be regulated by the ability of the farmer. Some farmers who are the reverse of neat in their work make more money than their neater neighbors, but the neatness would probably tell in their favor in the sale of their property. Some work never pays except to please the eye, but you can't do good farming without doing it neatly and well. It pays to plant trees and paint buildings, but it does not pay to take down a good fence and put up a fancy one. The destruction of weeds and bushes, keeping fences and ditches in good order pays.

Wm. Webster said it was an old adage that cleanliness is next to godliness, and neatness being akin to cleanliness, logically speaking it certainly pays. Corn rows, for instance, cannot be too neatly put up. In putting in wheat a careless driver may run against a shock, pull some out, thus leaving a place for rain to get in and spoil the corn. Every neat farmer is an advantage to his neighborhood, as neatness is catching. A stone or a worm fence may be kept up neatly. Circumstances must govern the degree of neatness a farmer can observe. If he has a large income he might go to some expense for show.

D. C. Timanus said that anything worth doing at all is worth doing well. Well kept farms are a great attraction to a neighborhood, and pay, too. Things kept neatly and in order last as long again.

N. N. Nock said there was economy in neatness. You can get better and quicker work out of implements and machinery kept neatly. If stock is kept thrifty and comfortable you can get more service and quicker service out of it than you can from neglected and ill-cared for stock. The surroundings of the home should also be made neat and attractive. It is a great advantage to a neighborhood to have thrifty, well-kept places. You would have to carry neatness to a great extent to make it unprofitable.

Geo. R. Cairnes said neat farming is attractive to strangers, who are more likely to buy land where farms are neatly kept, and thus neat farms are likely to bring among us a class of people who would be of advantage to the county. Neatness in farming pays, but it should not be carried to too great an extent.

The President, S. B. Silver, said to make money a certain degree of neatness is required, and a farmer should show this in all his transactions.

Mr. Webster said he did not agree with the idea advanced that it should be the aim of the farmer's life to make money. It should be the aim of every man to make the world better by having lived in it. If he can make it better by making and spending money, then he would agree with the proposition.

Adjourned to meet at "Highlands," the residence of Mr. John Moores, September 15th. Subject: "Roads," Committee of inspection, Messrs. Webster, Rogers and Hays

Different Breeds for the Dairy.

The Toronto *Globe* gives the following as the conclusions from experiments at the Ontario Model Farm as deduced from Prof. Brown's last report:

An average cow for dairy purposes should give twenty pounds of milk per day during 300 days every year; eight pounds of cream for every 100 pounds of milk, forty-five pounds of butter from every 100 pounds of cream, and fully ten pounds of cheese for every 100 pounds of milk. Bulk, volume, or per cent. of cream, is no safe criterion of the quantity of butter in that cream; weight alone is the proper mode of judging. Breed, as much if not more than food, affects the quantity and quality of milk, cream, butter and cheese. In Ontario experimental-farm experience, the Shorthorn is an average milker, short in duration per season, low in specific gravity, high in butter, and also high in cheese production. The grade of this breed approaches the nearest of any others to what is called a "general purpose cow." The Aberdeen Poll is low in quantity of milk, and the second highest of any in specific gravity. The grade in this breed is much improved in milk properties, giving a greater weight of cream, though a lower per cent. of it. The Hereford is not more prominent than the Shorthorn and Aberdeen Poll in regard to milk, except in proportion to butter from cream, in which it is highest. The grade is very prominently in advance, particularly in proportion of cream, but one of the lowest in cheese. The Devon is most distinct in highest specific, and the weight of cheese from milk. We have no experience with the grade of this breed.

The Galloway milk appears to be of a peculiar texture—rich, or so very small in butter globules as to rise very slowly and very indistinct in the test tube.

The Ayrshire is a particularly heavy, long milker, giving five times her own weight per season. The milk is somewhat low in gravity and per cent. of cream, but it is over the average in cheese production. The Ayrshire grade is not improved in any respect except in duration of milking season.

The Jersey is remarkable for proportion of cream, averaging thirty-five per cent., and giving a value of dairy products incomparable to any other breed in our experience. The native, or common cow of Ontario, not Canada properly, because Quebec in particular stands distinct in her class of dairy cows, takes a high place in value of annual produce for ordinary dairy purposes, and along with the Shorthorn grade is peculiarly the dairy cow of the country.

Horticulture.

The Orchard and Fruit Garden.

Frequently the advice has been given to fruit growers, through horticultural and agricultural mediums, to not cultivate their orchards too late in the season, as such late tillage would tend to prolong the growing period of the trees to an extent endangering the proper and thorough ripening of the growth, upon which the following year's crop of fruit is dependent; and in case of a severe winter following, the fruit buds in orchards so cultivated, are quite likely to be frozen, etc., etc. This advice for more northern latitudes, and where severe freezing weather begins earlier than here, may be all right; but for Maryland and southward, there is not one particle of practical common sense in it. To the "fine-thread" "theorizer," it may present itself in the light of an important consideration, but in real practice it is found to be an impossibility to keep a bearing orchard growing to such time in the fall, as to prevent thorough ripening of the wood; the trouble is to keep them growing long enough. Taking the subject as a whole, it is not too much culture that does mischief in

our orchards, but just the opposite; if there were three times as much cultivating and manuring done, as is the present practice, and has been since our earliest recollection, we would be able to supply our markets with fruit of infinitely superior quality than we now do. A very plain illustration of the truth of this assertion came under our notice this season. A gentleman having two peach orchards, one on land carefully and thoroughly cultivated, and in such a state of fertility as would insure a good crop of corn, the other on poorer land, and not so well tilled; the difference in the same varieties grown in these orchards was surprising—and in the same market, the difference in prices obtained was no less so. Hence, such of our readers who contemplate planting orchards in the future, we would with much earnestness urge to carefully consider the after care and management of their trees, before deciding upon the number to plant; and if not certain that one thousand trees (ten acres, if peach) can be properly cared for, both as regards culture and manure, cut down the quantity until that point will be reached to a certainty.

In Peach-growing districts, nearly every farmer has an orchard ranging in size from two or three hundred trees to five thousand. The proper management of even ten acres of orchard in connection with the labor incident to farming is a matter of no small moment, and demands a business capacity, such as is not possessed by more than one man in four of those engaged in farming. As a rule, either the business of the farm or that of orchard management, is bound to suffer more or less every year, and unfortunately it is too often the case that both suffer. First, the growing scarcity and utter worthlessness of labor, is to be considered; next, it must be remembered that the plowing and cultivating of these ten acres of trees, will to some extent interfere with the tillage of farm crops; and then when once in bearing—when the farmer has his fellow to prepare, his fodder to take down, and a dozen other things pressing upon his time—then is the time when there is vexation of mind and weariness of body; there can be no halting at this juncture; metaphorically, "the iron is hot," and strike is the only alternative. We agree with the views of a Hibernian friend who holds that "It is better to have too much of a good thing than not enough;" but a big crop of peaches to handle in a short period, and that too at a busy time on the farm, requires a good administrative cast of mind, with plenty of physical "grit" thrown in, to make it an endurable success. It is not only important that the planting of a Peach orchard receive this kind of study before ordering the trees, but it is equally important with other fruits—apples, pears, or whatever kind it is the object to grow; no less so in strawberries, raspberries, blackberries, etc. In fact, proper decision here, is paramount in importance to that of procuring the right varieties, for this reason, that it matters not, though your varieties may be the very "cream," yet with improper culture, or rather no culture upon half starved soil, the result is more vexing than if you had planted inferior kinds; in either case, though, you are out of pocket.

We refer to this subject at this time, more particularly for the reason that every planting season enlists new recruits into the army of fruit growers, and the "raw recruits"—those lacking experience—are the ones most likely to be led into "over planting," by the flattering results obtained by calculations based upon the product of a single tree, or a small orchard, well cared for. It is very easy, after knowing that half-a-dozen crates were produced by a single tree, that netted two dollars per crate, to multiply the twelve dollars thus obtained by one thousand, and by figures—those identical little characters that have the enviable reputation of carrying with them a veracity as pure as that of the

dear little boy that hacked his father's favorite cherry tree with the "little hatchet"—yes, by actual figuring—on paper—one thousand trees will net the grower twelve thousand dollars. This is a very simple theory, yet, simple as it is, it has a fascination for the inexperienced planter, which only matures into sad disappointment. True, the average life of man is not very long at best, and in order to accomplish anything worthy of remembrance by his friends, he is compelled to run his business with all possible speed; yet it must not be forgotten, that too much haste may permanently destroy the brightest hopes, reacting like a withering blight upon energy and enterprise.

Kitchen Garden—September.

In the early part of the month turnips may be sown and those already up should be timely thinned. Kale and spinach may be sown and onion sets planted at any time when the ground is in good condition. For the last two articles the ground can hardly be too rich, and it is not wise to trust to artificial manures alone. Rows may be 15 inches apart. Did time permit I would prefer to sow spinach by hand. There are always blanks in the rows when the machine is used. Cabbage and cauliflower are usually sown in well prepared soil from the 20th to the 25th and it will not be safe to vary much from these dates. There is so much vacant ground at this season that it is well to keep up the habit of sowing rye to cut green in spring, to make mats or to use as a mulch about trees or small fruits. Celery requires to be kept well hoed and cultivated. Artificial watering appears almost indispensable for celery at times, but such laborious work soon takes away the profit of the crop.

Flat Culture.—Up to the present season I had never known potatoes to be raised without a certain amount of earthing up; and had time permitted no doubt I would have followed the old habit. The crop is unusually good here as elsewhere and all the better I believe for the want of the bank of earth. Here and there a green end may be seen a half inch or so above ground showing that a single inch of earth drawn up would probably be just the thing. The rows are 2½ feet apart for early rose, which I find to be the best distance.

Good-bye Potato Bugs.—Last year I mixed the usual quantity of Paris Green and plaster required annually for my potato patch, but found that I had sufficient left over to do for this year, and now again, I believe, enough for next year, showing that we have got them pretty well under control. I pay no attention to them in the early part of the season, but dust the vines when the young brood comes along. I have an idea that from the Paris Green and plaster having been mixed the year previous the compost is stronger than if mixed just before using. It was surprising to see how slight a dusting did the work.

Towards the end of the month is a good time to lift and heel in strawberry runners for spring planting. For raspberries and blackberries all should try the close pruning so strongly practiced and recommended by Mr. Purdy, whereby the great labor of staking and tying is avoided. Those, however, who have only small gardens had better plant more closely and keep the vines tied up in the old way.

Ordering Plants by Telephone.—This is bound to be a convenient arrangement if one is only sure of his man at the other end of the line, but my first trial was anything but satisfactory. A few thousands of cabbage plants came along, so spindling in their growth that when heeled in an inch apart but few of them touched each other. Stunted old things they are; I doubt if I shall ever plant them; would gladly return them for a trifle of what they cost.

Nurserymen and seedsmen, while not neglecting the telephone, are showing, in another way, a still greater spirit of enterprise. It may not be generally known that many of the former avail themselves of the use of stenographers to help them through with their immense correspondence, and now we have Peter Henderson dropping his autograph letters and handsome signature and simply hinting his thoughts to one who is ever on the alert to receive, print and transmit them. The telephone is tangible and very generally appreciated; the more subtle medium of a stenographer and his ways in the matter of expediting business is not so readily understood by the average business man.

The flowers.—These will soon be gone and, as a rule, the best way is to let them go. In the kitchen garden hardy plants should predominate, and things that are readily killed by frost are hardly worth saving unless one has a greenhouse. Some things, however, that are almost hardy may be kept over in a frame, and geraniums, if well cut back and kept rather dry will keep in house or cellar. Transplant violets to a frame of rich earth, and make a bed of parsley in the same way. Flower seeds will be ripening and will often be worth saving. Rose cuttings generally root readily at this time in sand in a cold frame; if they root well they may stay there with the protection of the sash until spring.

There will now be some time for ditching, draining and other necessary improvements. A drain-tile is one of the rarest sights in these parts. What do these people drain with, or do they drain at all?

JOHN WATSON.

To the Bee Keepers of Baltimore County and Vicinity.

The date fixed for the Annual Fair of the Baltimore County Agricultural Society at Timonium is fast approaching, and as Superintendent of the Apiary it becomes my duty to urge upon you the importance of contributing to its success. The society have doubled their premium list, over last season, and now amount to more than all the other Agricultural Societies of the State combined.

Ample provision will be made for an extensive exhibit of everything pertaining to this class, and I earnestly hope to see the space well filled up.

There are many good reasons for urging every bee keeper to turn out and make strenuous efforts to have this department the attractive feature of the fair.

Honey has become a staple product and it should be our aim to produce it in the most attractive and marketable shape, and there is no better place to "compare notes" than at the fairs.

To this end we should endeavor to popularize the consumption of honey by all classes, as well as to raise the standard of production by applying correct principles, and progressive art, to the management of our chosen pursuit.

Bees and honey are already "the great centre of attraction" at our fairs, and have given prominence to the industry, and thus becomes more apparent each successive year.

Let each bee keeper then contribute his or her best specimens. If you can't send bees, send honey, a bouquet of honey producing flowers, in fact anything to make a full exhibit. To the lady bee keepers of the State, this will afford an excellent opportunity to enter "the lists" with the sterner sex, and prove at least in this case that women can accomplish as much in this branch of industry as their brethren.

A meeting of the Bee Keepers of Maryland and vicinity and all interested, is called to assemble at the bee tent, at 11 o'clock A. M., Thursday, September 6th, for the purpose of forming a Bee Keeper's Association, by several prominent bee keepers of the State. Come one and all, and let the bee keepers exhibit at Timonium 1888, be "the fair of the season."

C. H. LAKE.

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Liberal reductions will be made on larger advertisements. Advertisements to remain on outside page subject to special contract. Transient Advertisements payable in advance—all others quarterly. Advertisements should reach us by the 15th and 25th of the month, to secure insertion in the succeeding issue.

*. Subscribers who have minerals, ores, marls, fertilizing materials, or other substances, will be advised through our pages, by competent chemists, as to their composition, uses and value, by forwarding specimens to this office, *expressage or postage prepaid*. Questions as to application of chemical science to the practical arts will also be answered.

*. Persons desiring information or advice on diseases or injuries of domestic animals, will receive replies from a competent veterinary surgeon, by giving a plain statement of the symptoms, etc.

At the office of THE AMERICAN FARMER are located the offices of the following organizations, each of which its proprietor, Wm. B. Sands, is secretary:

Maryland Horticultural Society.
Maryland Dairyman's Association.
Maryland State Grange, P. of H.
Agricultural Society of Baltimore Co.
Also, of the Maryland Poultry Club,
Thos. W. Hooper, Secretary.

BALTIMORE, SEPTEMBER 1, 1883.

THE address of Dr. Ellzey before the Woodlawn Agricultural Society, and forwarded for publication in THE AMERICAN FARMER, contains a fund of valuable information upon the subject of Fertilizers, which every farmer should understand as necessary to his success in the honored and responsible vocation in which he is engaged. Some of his views, however, as to the value of certain fertilizers now in almost universal use in the Middle and Southern States will probably not pass without lively criticism. The subject indeed is one open to a wide discussion, and may lead to such an one as that of many years ago in these pages between Col.'s Capron, of Prince George's, and Carey, of Baltimore county, as to the best means of resuscitating depleted soils, or that, on another branch of the same subject, between Hon. Charles B. Calvert and Edward P. Roberts, Esq., the principal associate editor of the FARMER. These discussions were supplemented by the Prize Essays of Edward Stabler and others on the Improvement of Worn-out Lands, and no doubt led to the great advancement in the agriculture of this and other States which has been witnessed since their publication.

COMBINATION SALE AT WASHINGTON CO. FAIR.—It will be seen by the advertisement elsewhere that at the Fair in Hagerstown, October 16 to 19, there will be a general sale of imported stock, implements, machinery, etc., contributed by many exhibitors. The county is a rich and prosperous one, and among its pushing farmers many purchasers ought to be found. The plan of the sale is a good one and deserves success.

THE BALTIMORE COUNTY FAIR.—As we go to press all the indications point to a large and successful Fair at Timonium. The stock exhibits will be numerous and good, Jerseys predominating as usual, and in every other department a varied and full display is expected.

AGRICULTURE IN THE SOUTH.

Progress in Agriculture—Is there any Room for Further Improvement?

By TH. POLLARD,

Ex-Commissioner of Agriculture of Virginia.

In our last, we were speaking of what the United States Government had been doing in modern times to promote the progress of agriculture. Prof. Riley instances the fact that the Government last year, or the year before printed 300,000 copies of the Annual Report of the Commissioner of Agriculture, as an evidence of liberality in behalf the great farming interest of the country. It is estimated that one-seventh of the population of the United States is employed in agriculture, which would amount to seven millions. But taking another estimate, which would be fairer in reference to the needs of farmers for the reports. The last census (1880) shows there are 4,008,907 farms in the United States. Now we should think that each head of a farm should have one of these reports if they are valuable, and we think they contain much matter that is valuable, while they contain much that will not interest the ordinary farmer, but as it is, the 300,000 reports cannot reach as much as $\frac{1}{10}$ of the farmers. Admitting that one half the heads of these more than four millions, are not reading men, we shall have more than two millions left who should be supplied with these reports, and it is probable that much more than one half, as supposed, would read the reports or portions of them, if put in their hands. This shows how inadequate is the support given by our government to the great interest of this great country, an interest, on which all other interests of the people depend. In 1878, our government appropriated to the Department of State more than a million dollars, to the Treasury Department, more than twelve millions, to the Department of Interior three and a half millions, to Post Office Department nearly five millions, and to the War and Navy Department (including military and naval establishments) more than fifty millions, while to the Agricultural Department the appropriation was \$208,640. We do not argue that the appropriations to the first named departments are too large, but we doubt not they might be smaller, and accomplish the same purpose, if economy and honest management were enforced, but we do say emphatically that the appropriation to the Agricultural Department is too small. Some two or three years since General Le Duc, then Commissioner of Agriculture, requested of Congress an appropriation to enlarge his Chemical Department and employ chemists enough to analyze all the fertilizers the farmers might desire, and to purchase an experimental farm near Washington. He told the Congress that the room for chemical work was in the basement of the agricultural building, was badly ventilated, was cramped, and every way unfitted for his purposes, and urged the farm as a place where numerous experiments might be conducted, and unsettled agricultural problems might be solved. But no attention was paid to his suggestions. The different States are doing something of importance towards the progress of agriculture. Some at the North, and some in the West have their Agricultural Departments and State Boards of Agriculture, and seem to be working efficiently, but our remarks are particularly about "Agriculture in the South." Virginia has a Department

of Agriculture, under control of a Commissioner of Agriculture, but with an insufficient appropriation, only \$5,000, (from which comes the salary of the Commissioner and his clerk). A respectable cabinet of minerals and productions of the State have been collected, and yearly reports have been issued, except, we think, for 1882, as also a "hand-book of Virginia," with a recent map of the State. (The writer was Commissioner of Agriculture from July, 1877 to January, 1882). This department was established in July 1877. Georgia has a department of agriculture established some ten or twelve years since. The first reports from Dr. Janes, Commissioner, were very creditable. Some three or four years since he was superseded by Col. Henderson, from whom we have seen no reports. In this State and Virginia, these departments have been subjected to political influences, and their heads are the appointees by the dominant party. South Carolina has a Department of Agriculture, Col. Butler, the Commissioner, and seems to be doing a fair work. Alabama has an Agricultural School at Auburn. Their reports, if any have been published, have not come under the writer's notice. North Carolina has a Department of Agriculture, Mr. McGehee, the Commissioner, and Dr. C. E. Dabney, of Virginia, the chemist, and we think it is conducted with much success and ability, particularly on Dr. Dabney's part, who has issued the only reports from the institution, we have seen, and they are able and instructive. North Carolina is the only Southern State which has taken steps to be represented at the coming Boston Exposition this fall, in behalf of agriculture, arts, mineral productions, etc., and it is said that this State will have there a superior collection, especially of its minerals, in which it abounds.

Among the most prominent improvements in modern agriculture has been the invention of labor saving machinery. The writer can remember when there was almost no farm machinery—nothing but the wheat fan and plows. Wheat was gotten out by horses' hoofs, flails and a lumbering old roller made by putting blunt pins through a large log, which was drawn around by horses. Many farmers were slow to avail themselves of farm machinery, and the English farmers, as intelligent as they are, as late as 1851 were still using the hand "reaping hook" to cut their wheat, as we witnessed in their harvest of that year. In that year McCormick's reaper was introduced into the country, being exhibited at the first "World's Fair" in London, and was tested on some of the wheat fields in the vicinity. The progress of improvement in agricultural machinery has been very decided in the last few years, and the improvement continues. To Americans is due most of the credit of these inventions. There is decided room for improvements in making this machinery out of better materials and of more durability. Farmers lose a great deal in time and money by the breakings which so often occur in machinery, part, no doubt, the result of bad management, but very frequently because of the want of the best materials, the best metal and the best wood and of the best workmanship. Defects are easily covered by paint, and the farmer should endeavor to buy only from workmen of known skill and honesty. The charge for machinery is ample to secure all the requisites of first-class implements. Farmers should endeavor to understand thoroughly the construction and working of every machine he uses, and should not entrust it in the field to any hand who does not well understand its management. As an aid to the proper comprehension of this subject it will be well for every farmer to provide himself with a copy of "Thomas' Farm Implements and Machinery" (price \$1.50), or some other good work on this subject.

I have recently read a work on "Land and Labor in the United States," by Mr. Moody of Boston, in which he comments on the machinery employed in agriculture, and particularly on the great "Bananza" farms of the Northwest. The results of labor saving as compared with hand work is wonderful. He further illustrates by an account of the machinery employed in textile fabrics, where labor saving as compared with the old mode with the wheel, and cards, and hand loom, is immense. The farms alluded to are, many of them, so large that notwithstanding the extensive use of machinery of all sorts, as many as 250 or more hands are employed on them during harvests, and then in the winter months only five or 10 men are employed to take care of the machinery, and the moderate amount of stock maintained on these farms. Mr. Moody contends that the machinery thus employed is working great harm to the laboring classes and small farmers, and that great poverty in these regions is the result. He says that the tenant farmers cannot compete with the Bananza farmers, with their large, expensive farm machinery. He cites a farm where 55,000 acres were in wheat, the nett profit being \$7 per acre. This would amount to a very large sum, while this profit to a moderate tenant or small farmer would rarely support his family, and besides, he could not realize this profit without machinery, which he cannot afford to buy. But we doubt Mr. Moody's conclusions. Without these large farms, the laboring classes might probably not get employment at all, and without machinery these farms would not have been established. If these large farmers by use of machinery make profits, it is no evidence that the tenant and small farmers would make larger profits, if there was no machinery in use. We can well remember when wheat in Virginia, before the use of machinery, sold year after year for 90 cents and \$1 per bushel, and recently I crossed a bill of my father's for groceries in 1838, which showed the ruling price of these articles was nearly the same as now, except for sugar, tea and coffee, which were higher. This shows the small and tenant farmers, were no better off then than now.

The fact that the price of horses and mules has increased since the introduction of railroads is a puzzler to those who think the use of machinery will bring down the price of farm products and injure farmers. We well remember when it was said that steam engines on railroads would break up the raising and profitable sale of horses. In place of this, their price has increased, and we never knew them higher than they were last spring; this being the consequence of the increased business of the country brought about by railroads stimulating production, and creating demand for horses to distribute it at their terminal points, passengers too, as well as products, and besides this, horses are in increased demand to carry these increased products to the railroads. It has become manifest that Europe cannot feed its population, and large production in this country will hurt no one, either large or small farmers.

THE trustees of Purdue University, Lafayette, Ind., have abolished the Greek and Latin departments from the institution. This gives agriculture and horticulture, and the sciences related thereto, a broad swing. The Hon. W. H. Ragan will superintend the experimental department of the college farm. He is best known as a horticulturist, being at present the efficient secretary of the Mississippi Valley Horticultural Society. Now that Purdue University is well rid of the dead weights of Latin and Greek the public will look for efficient work there in fitting the youth of Indiana for the active duties of life on the farm.—*Prairie Farmer.*

Home Department.

Moths.

We all know of the damage these seemingly insignificant pests are capable of doing, and exercise ourselves wisely and rigorously to protect our household goods from their depredations. Why is it, I wonder, that we are less careful about the moth-like habits which attack ourselves with far more damaging effect than our most valuable possessions are subject to from real moths?

The one of which I am about to utter some palpable truths is singularly free from observation of any kind. We rarely hear it spoken of, and never is it practiced openly, even I believe among the most degraded—and yet the vendors of the vile stuff, and the physicians also assure me that the practice is more common than the use of intoxicating liquors, and is supposed to be more injurious to the intellectual faculties, and equally so to general health.

This habit to which I refer is that of "snuff rubbing." I would not venture upon a subject so generally avoided and so unpleasant even to speak of, were it not for the rising generation. Among those who practice it there seems to be a lack of conception of the evil thereof, and they rarely take any pains to prevent children from acquiring a taste for it. The injurious effects are slower in manifesting themselves and never so completely overcome the senses as opium and alcohol, but they demoralize the individual quite as surely, unfitting its subjects for intelligent thought or action, and compel them to go through life shamefacedly, with a constant sense of having something to hide. It is also a constant drain upon the purse, and in a great majority of cases runs away with a large percentage of somebody's hard earnings.

All this is equally true, of course, of the ordinary use of tobacco, as far as the cost of it goes, but custom among the better class of people renders the open use of it to some extent respectable, while with "snuff rubbing" the habit creates slyness, and so degrades the man or woman at the start, and then renders them so stupid as to hamper their usefulness, and unfits them for the satisfaction of ordinary intercourse, to say nothing of the impositions they are consequently subjected to.

What I am desirous of doing is to awaken, if possible, the mothers who are addicted to this practice to a sense of the condition of slavery into which they are fallen, and persuade them therefore to keep their children from a like bondage. I might exhaust the whole field of argument which abler pens than mine have used to condemn the use of tobacco and alcoholic drinks, and they would apply equally to this abominable habit, but space nor the occasion neither of them admit of it: besides, it is an old, old story, and we all know it by heart. This other habit, however, is so much overlooked, and comparatively no effort made to arrest it, that I venture in this modest corner to raise my feeble voice, hoping it may impress some one sufficiently who may have the ability and power to take some steps toward protecting the young from the baneful example so common among their elders. I do wish I were better prepared to show just how the vile practice affects the system; I trust, however, some one who does know all about it will raise a voice of warning in time to save the coming generation.

Why do we so weakly permit moths of various kinds to prey upon our highest and best faculties? They come upon us in forms we can easily recognize and escape from if we are so minded; sloth, depraved appetites of various kinds, selfishness, profligacy, looseness of tongue or temper, are all, like moths to the garment, eating into and unfitting us for the uses for which our Creator designed us, and which it would be our highest good to accomplish.

A Cheap Filter.

Very many families desire some inexpensive device for filtering rain and other waters to be used for cooking and table use. A cheap and very efficient filter may be made by using a spirit or wine cask, placing it on end, with the head removed, and having a faucet at the bottom to draw off the clear water. To fit it for a filter, take the removed top head of the cask, and with a small bit bore holes all over it, then place four clean bricks or blocks of wood on the bottom, and on these rest the perforated top. Now fill upon it about four inches of charcoal chopped into small bits the size of peas, and over this place a layer of clean sand, six inches deep. Impure water poured into the cask on top of the sand, will become clear and sparkling after a little while, or as soon as all fine particles are worked out of the charcoal and sand. This filter will not need renewing oftener than once in two or three months.—*Popular Science Monthly.*

BAD HABITS are small at the beginning, but they grow to enormous size. It is as difficult to destroy them when fully grown, as it is easy to kill them when "in the egg." A little giving way to a bad temper may end in murder. Little fits of idleness may lead to dissolute habits. How big these little sins may grow we dare not even think. The best way then is to take hold of them, put a check on them while they are young, ask God to give us His grace to overcome them, before the take possession of us, and destroy us. The longer we put off trying to check these evils in our hearts, the harder shall we find it to be. So let us go to work at once, and try to overcome them while they are small, not wait until they are fully grown, when we shall more than likely be overcome by them.

SOIL FOR POTS.—Most soil needs a liberal admixture of peat or well pulverized muck before it is in a condition for using in pots. The bottom of the pots also needs a layer of finely-broken brick, over which should be placed a little sphagnum. Peat and sphagnum are not always easily procurable, and in such cases a good plan is to dig up clumps of fern-roots from any brake bog by means of an old axe, and then to chop them up with a spade or axe. When well cut up the roots may be pulled out and shaken, and then used as a substitute for sphagnum. The fine, muck-like earth which retains will be nearly equal to florists' peat for the cultivation of most common plants.

A Large Yield of Wheat in Dorchester.

Danville, September, 1883.
Messrs. Davison & Co.
Gentlemen: When I was up to purchase my fertilizers you asked me to give you an estimate of how I prepared my land last year for wheat that I raised 50 bushels per acre. I flushed up 10 acres of stubble that I had raised 38 bushels per acre the year before with your fertilizer. The land is a yellow clay soil, after flushing I rolled and used cultivators on it, then sowed 200 pounds per acre of your "High Grade" Superphosphate broadcast, then drilled 1½ bushels wheat per acre, it is a new variety I got from the Patent Office three years ago, smooth head, red, long berry, as forward as the Fulse, and stands the winter better than any I have ever seeded. I grew 500 bushels on 10 acres. I think your fertilizer is the very thing for farmers in this section, the clover the largest I ever had.

Yours, &c.,
L. P. SKINNER.
Dailsville, Dorchester Co., Md.

STILL POND, KENT CO., MD.,

August 4, 1883.
Messrs. J. E. Tygart & Co., Smyrna, Del.
Gents: I have been using on my farms and selling your Star Bone Phosphate for the past six years by the side of Turner's and all the leading brands manufactured in Philadelphia and Baltimore, and must say that I have never used or sold a fertilizer that has given on all soils such universal satisfaction. So far as I can learn, it has beaten all phosphates producing wheat and corn in this country; and, as an evidence of the standing of Star Bone Phosphate in this country, you will find our sales, as far as I can learn, very large, as I am having inquiries every day. In fact, it is the leading phosphate in this country.
FRANCIS H. HARPER.

J. M. Laroque's Anti-Bilious Bitters.—If you feel dull, drowsy, debilitated, have frequent headache, mouth tastes badly, and tongue coated, you are suffering from torpid liver or biliousness, and nothing will cure you so speedily or permanently, as J. M. Laroque's anti-bilious bitters. 25 cents a paper, \$1.00 a bottle. For sale by W. E. Thornton, sole proprietor, Baltimore and Harrison streets, Baltimore.

Ayer's Ague Cure is the only remedy known, which is certain to cure Fever and Ague permanently, by expelling the malarial poison which produces the disease. It does this surely, and leaves no ill effects upon the system. Nothing is so thoroughly depressing and discouraging as the periodical return of the alternate chills, fever and sweating, peculiar to this disease.

Our Western people are liable to be laid low, by malarial fever, when breaking up new lands. The folks in the East are also complaining of fevers, chills and agues, arising from decaying vegetable matter and imperfect drainage. For either East or West the best remedy is Ayer's Ague Cure.

Ah! you have a headache! Why don't you try Ayer's Pills? They will relieve the stomach, restore the digestive organs to healthy action, remove the obstructions that depress nerves and brain, and thus cure your headache permanently.

Baltimore Markets—Sept. 3.

Live Stock.—*Beef Cattle.*—The market has been extremely slow to-day throughout, and prices ¼¢ lower than last week. We quote at \$2.50 @ \$3.00. Most sales were at \$2.25 @ \$2.50 per 100 lbs. *Pigs.*—Prices remain unchanged since Monday, quality considered, at 7½¢ @ 8¢ per lb. net, and trade has been fair at these figures. *Sheep and Lambs.*—There have been no fresh arrivals since Monday. Trade has been slow and prices unchanged. We quote butcher sheep at 3½¢ @ 4¢, and Lambs at 4½¢ @ 5¢ per lb. gross.

Tobacco.—*Leaf.*—The arrivals of Maryland continue liberal, and the market is active and firm. There is a good inquiry for Ohio, and the market is firm for all grades. We quote: Maryland inferior and frosted, \$2.00 @ \$3.00; do. sound common, \$3.50 @ \$5.00; do. good common, \$5.50 @ \$6.50; do. middling, \$7.00 @ \$8.50; do. good fine red, \$8.50 @ \$11; do. fancy, \$12 @ \$14; upper country, \$5.00 @ \$10; do. ground leaves, \$3.00 @ \$8.00. Ohio inferior to good common, \$4.00 @ \$6.00; Greenish and brown, \$5.00 @ \$7.50; do. medium to fine red, \$7.00 @ \$10; common to medium, spangled, \$7.00 @ \$10.00; do. fine spangled and yellow, \$11 @ \$16; do. air-cured medium to fine, \$6.00 @ \$14.00.

Flour.—Stocks are moderate and holders are not at all uneasy, but the demand is restricted to buyers' urgent wants, and the market is quiet but steady. We quote as follows: Howard street and Western Super, \$3.00 @ \$3.75; do. Extra, \$4.00 @ \$5.00; do. family, \$5.25 @ \$6.00; City Mills Super, \$3.00 @ \$3.75; do. Extra, \$4.00 @ \$4.75; do. (Rio Brands) Extra, \$6.00 @ \$6.25; Baltimore Winter Wheat Patent, \$7.50 @ \$8.00; High Grade Family, \$6.75 @ \$7.00; Second Grade Extra, \$6.50 @ \$7.00; do. Third do. do., \$6.25 @ \$6.50; Fine, \$7.25 @ \$7.50; Rye Flour, \$3.75 @ \$4.00; Corn Meal, per 100 lbs., \$1.30 @ \$1.35.

Wheat.—Southern Wheat is quiet and easier for shipping grades, of which there is a more liberal offering. Choice milling grades are comparatively scarce and rule steady. Common and tough parcels sold at 95¢ @ 110¢, good to choice Fultz at \$1.13 @ \$1.15; do. and long berry at \$1.16 @ \$1.19. The market for Western Wheat is inactive but steady, closing dull. The closing quotations were as follows: Spot No. 2, \$1.15 @ \$1.15½; September, \$1.15 @ \$1.15½; October, \$1.17 @ \$1.17½, and November, \$1.19 @ \$1.20.

Corn.—The supply of Southern white Corn is more limited, and the market is easy, with sales of inferior at 57¢, and of good at 61¢. Yellow is about steady at 61½¢ @ 62¢, for good to prime. Little or no business is done in Western Corn, and the market continues dull and nominal. The closing prices were: 59½¢ @ 59½¢, for spot, 60½¢ @ 60½¢, for September, and 60½¢ @ 60½¢, for October.

Oats.—The market holds quiet but firm, holders generally insisting on higher prices. We quote Western White, new, 36¢ @ 38¢; Western Mixed, new, 32¢ @ 35¢; Pennsylvania, new, 35¢ @ 38¢; Maryland and Virginia, new, 30¢ @ 33¢.

Rye.—There is quite an active inquiry, and sales were of prime new Maryland at 67¢.

Cotton.—There is no pressure to sell, and the market is quiet but steady, with indifferent demand and no recent sales. We quote as follows: Middling at 16½¢ @ 16½¢, low middling at 9½¢, and good ordinary at 8½¢.

Provisions.—Speculation is dull and lower, but the local order trade is fairly active and prices are unchanged. Packed lots from store are quoted as follows: Bulk shoulder 7½¢; clear-rib sides, 8¢; Bacon shoulders, 8½¢; clear-rib sides, 9¢. Hams—Sugar-cured, 15½¢ @ 16½¢. Refined Lard, in tierces, 10½¢. Mess Pork—New heavy, \$15 @ \$16.

Butter.—There is a brisk demand for strictly choice stock and the market is firm, with light supply. Medium and lower grades are dull and nominal. We quote choice New York State at 21¢ @ 23¢; fresh Western choice at 14½¢ @ 15¢, do. good to prime at 12½¢ @ 13¢, and near-by receipts at 10½¢ @ 11¢.

SEED WHEAT!

NEW VARIETIES OF GREAT PROMISE!

HYBRED MEDITERRANEAN—Cross between DIEHL and RED MEDITERRANEAN, combining the hardiness and prolificacy of the former with the flouring quality of the latter. Bearded, red chaff. Wheated last winter better than Clawsen. Have counted 72 heads on one stool. DOES NOT RUST. Price, \$15.00 per bushel, \$4.00 per peck (not prepaid). \$1.00 per pound, prepaid.

MARTIN AMBER—Has taken FIRST PRIZE THREE TIMES at Pennsylvania State Fairs. Bushel, 36¢; peck, 92¢; 3 lbs., \$1. Also pure strains of Velvet Chaff, Clawsen, Fultz, Red Mediterranean, etc. \$2 to \$3 per bushel.

HIRAM SIBLEY & CO. ROCHESTER, N. Y. CHICAGO, ILL.

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cheaply and successfully should write us for our pamphlet on pure fertilizers. A good fertilizer can be made at home for about \$12 a ton by composting with POWELL'S PREPARED CHEMICALS. References in Every State. Agents wanted for unoccupied territory. Apply with references.

BROWN CHEMICAL CO.

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Powell's Tip-Top Bone Fertilizer.

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Yearling and 2 Year Rams.

ISO 20 Breeding Ewes from the Best Strains of Henry Webb and Lord Washington for Sale by

SAM. J. SHARPLESS,
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PEACH TREES.

We are prepared to make low rates on large lots for Fall Trade. THOSE WANTING 5,000 to 10,000 WILL PLEASE CORRESPOND WITH US. We have BARLETT and KIEFFER PEAR, CHAMPION and ORANGE QUINCE, REED PLUM, APPLE and CHERRY TREES, and SMALL FRUITS in great variety.

DAVID BAIRD & SON,
Manalapan, N. J.

BEST MARKET PEAR.

99,999 PEACH TREES All best varieties of new and old Strawberries, Currants, Grapes, Raspberries, etc. **EARLY CLUSTER** New blackberry, early, hardy, good. Single hill yielded 12 quarts at one picking. Send for Free Catalogue. J. S. COLLINS, Moorestown, N. J.

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SHRUBS, ROSES, &c.

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WASHINGTON COUNTY FAIR
HAGERSTOWN, MD.,
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JOHN SAUL, Washington, D. C.

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—For Only—

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To further the ENORMOUS sales of Beatty's Cabinet Organs during the month of August, and until September 15, 1883, midnight, the following Special Offer is made, namely: If any reader of this newspaper will clip the following notice or coupon and remit it promptly, together with only \$49.75 in cash, by Post Office Money Order, Registered Letter, by Check or Bank Draft, on or before September 15, 1883, I will box and deliver on board cars here the following described PARLOR ORGAN, with Bench, Book and Music, the regular Catalogue Price being \$107.75. I desire this beautiful Cabinet Organ introduced without a moment's delay, and to those who will order this Organ within seven days from date of this newspaper, a further deduction of \$1.00 will be allowed, making the instrument cost in all only \$47.75. My sole object is to have the organ introduced without delay, thereby securing your good will in your immediate vicinity, as further sales are sure to follow at the regular catalogue price, \$107.75. Be sure to clip the following notice or coupon and mail it to me with your order.

This notice or coupon, if returned to DANIEL F. BEATTY, Washington, New Jersey, from any reader of the AMERICAN FARMER, on or within the time specified as above, together with \$49.75 in cash, entitles holder thereof to one Beatty Organ, No. 800, as specified. Money to be promptly refunded, with interest at 6 per cent., if the organ is not just as represented after one year's use.

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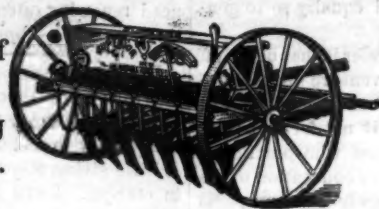
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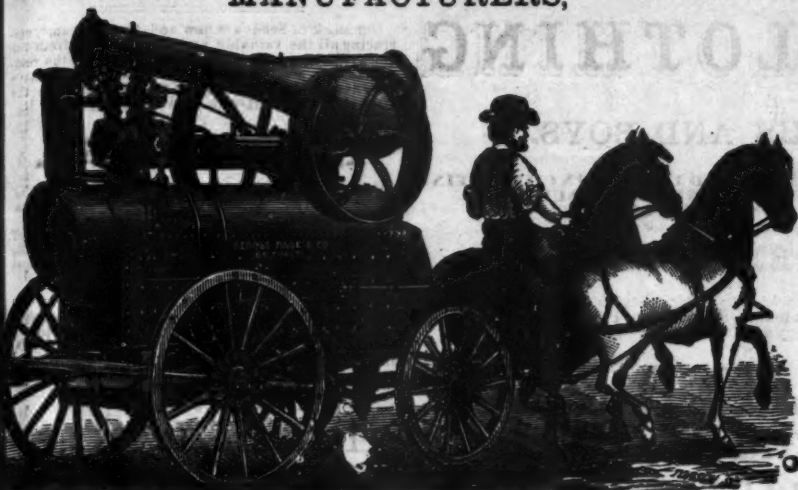
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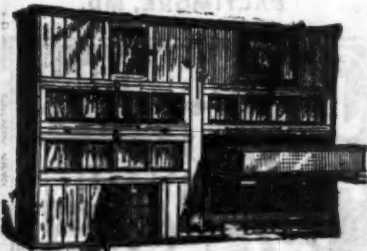
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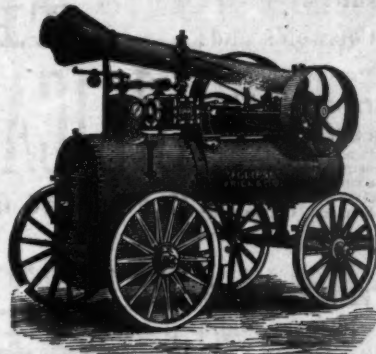
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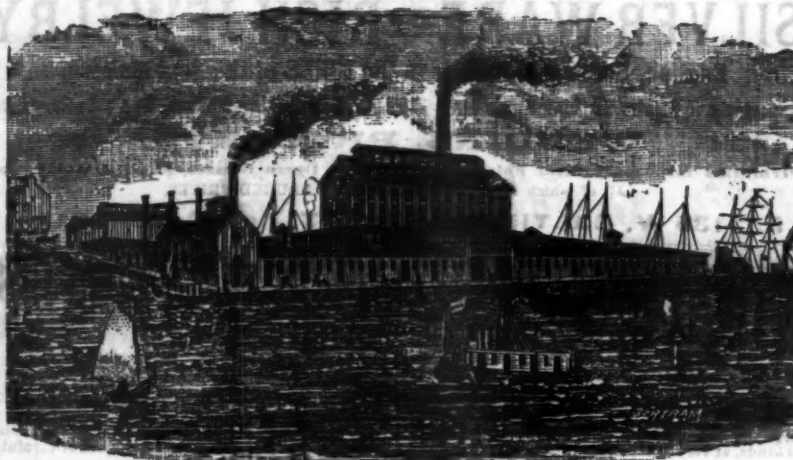
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ESTABLISHED 1819

NINTH SERIES.

BALTIMORE, MD., SEPTEMBER 15, 1883.

VOL. II.—No. 18.

Fall Treatment of Meadows.

Now that the hay is off from the meadows, the propriety of pasturing the aftermath may be discussed. There are conflicting opinions upon the question. Some farmers prefer and advise to pasture the aftermath closely, leaving no dead growth in the bottom to smother the young herbage in the spring and to clog the mower when cutting the next year's hay. Some persons who are not farmers and cannot take a practical view of this matter, and some who are, think it better to leave the aftermath as a protection to the sod against the winter's frosts and thaws. There are some things to be said on both sides, but the right course depends upon circumstances, which vary considerably. For our own part, we prefer to get all we can from the soil, believing that the earth is generous and sufficiently fruitful to give us freely all we can take. Moreover, having had experience with grass lands that have a thick aftermath left upon them, and realized the difficulty of cutting the hay the next season, we would even take extra pains to have the aftermath as closely eaten or mowed off as possible late in the season. We have found, too, that the dense dead grass provides harbors for mice, which burrow in the sod and make havoc with the grass roots. It also protects the sod from frost and thus permits the white grubs and other insect larvae to feed upon the roots, so much as to frequently cut off acres of sod loose from the soil and leave it as free as a carpet upon it. These injuries are so severe and so frequent upon meadows covered with dead aftermath that we should view with great apprehension the probable condition of the sod in the spring. But we have said that it depends upon circumstances whether the aftermath should be eaten or mown or not. Certainly, it depends upon the condition of the grass and upon the character of the soil. If the grass is a new seedling and the roots have not taken a firm hold upon the soil, the aftermath had better be left as a protection to them. If the soil is one that readily heaves with the frost and there is danger of injuring the sod by tearing the roots, the same course should be taken. If the meadow is thrifty and the sod firmly established, we would take off all the grass up to the latest period of the fall, but we would repay our draft upon it by giving back to it early in winter a liberal top-dressing of manure, or just now a dressing of plaster or fine manure, which would strengthen the roots and thicken the sod and make this an equivalent protection by its denseness, as the aftermath could be by its length. One other point should be noticed, which is, that if the grass is pastured it is indispensable that the droppings either of horses or cows should be broken up and evenly spread before the winter, to avoid their wasteful and unsightly effects upon the field the following year. When sheep are pastured this is not necessary, and where there is a choice of stocks to be used sheep will be found by far the best for the purpose. In fact, a farmer might do well to give away the aftermath of a meadow to any neighbor who would pasture it closely with a flock of sheep, for the sake of even clearing of it off and the return of fine manure the flock would make to the soil.—*N. Y. Times.*

North Carolina Wheat.

A novel exhibition was made in North Carolina this year, which was remarkable for a State which has been stigmatized as the "Rip Van Winkle" of the Union. It was a fair for the display of wheat samples and cattle, and the account in the Raleigh papers shows that that staid old State may be found to be among the very best wheat-producing regions of our country, and that she is capable of producing the grasses of every kind to enable her also to become equally successful in the raising of cattle. The *Nor.* says: "The stock was very fine and the cereals and grasses made a display that could hardly be rivalled elsewhere. There were 128 varieties of grasses on exhibition. Of wheat there were 46 exhibitors. Some of the stalks of wheat were 5 feet ten inches high; samples very numerous; wheat beautifully cleaned and well sacked, grain full and plump. The exhibit represented the product of 200 acres, grown in various sections of the county and surrounding country. The average of these 200 acres, by measurement, is 31 bushels per acre. The largest yield is that of Mr. R. L. Cox, of Lenoir County, who produced 46 bushels per acre, manured with 200 pounds of fertilizer; next five acres, Geo. Mitchell, Winston, produced 40 bushels per acre, one sack fertilizer; Marshall & Dull, five acres, 30 bushels per acre, one sack fertilizer; Isaac Petree, one acre, 28 bushels, 200 pounds fertilizer; J. W. Spears, five acres, 25 bushels per acre, one sack fertilizer; J. P. & C. E. Crews, Winston, five acres, 24 bushels, one sack fertilizer; and several others, unfertilized, running from 12 to 20 bushels." Of cattle there was a very good display, especially of Jerseys, Guernseys and Devons, also a number of fine horses. Governor Jarvis was present and delivered a brief address of a practical character calculated to arouse interest in agriculture. His presence, he said, was as the Governor of the Commonwealth, and he came at their bidding, not for any political purpose, but in the discharge of one of the highest duties of his office and prompted by the interest he felt in such occasions. He came to give an evidence of his cordial support to such enterprises as these, which these patriotic and progressive gentlemen had undertaken. He was gratified to see before him such a large number of intelligent farmers, called together for the purpose of being benefitted in the business of their life. He was in full sympathy with these movements; agriculture was the basis of all prosperity, but the agriculturists had too few means of contriving for the promotion of their objects and purposes and for the elevation of themselves and their business. These annual reunions ought to be extensively utilized in every community for the purpose of uniting all agricultural elements in efforts of improvement. This Forsyth fair has great capabilities, and the exhibit made to-day proves how varied and rich are the resources of this section. He rejoiced cordially in the prosperity of which he saw so many evidences around him. In

the State generally he witnessed great improvement and he was proud of it. We must march forward to the music of progress.

Although he had found great prosperity in every and all sections of our great State, he had found none more decided than here at this favored region. He spoke of the great improvement in the town of Winston, that had been so notable at each of his successive visits, and he rejoiced in this progress and prosperity. He would not undertake to instruct them in agriculture, but there were some thoughts he would like to recall to their remembrance. After some further observations he spoke of the manufacturing interest of the State, which he hoped to see fostered and developed. No State in the Union offered more facilities and advantages for manufacturing, and this was being recognized. Five years ago we had fifty cotton mills, with 1,800 looms and 100,000 spindles. To-day we have seventy cotton mills with 3,000 looms and 176,000 spindles.

The woolen interest had increased in like proportion; the same with other branches of manufacture. Again, the mineral development of North Carolina was far in excess of anything to be seen in any other State on these topics, and said he did not underrate them, but that candor compelled him to say that agriculture was more important to our people, and that our advance in agriculture had been still more gratifying. In 1870 we reported 145,000 bales of cotton; in 1880, 339,598. Since then we have raised 450,000. And the quality has increased as much as the quantity. Of tobacco we reported in 1870, 11,000,000 pounds, and in 1880, 27,000,000 pounds; so said the census. It was the same with corn and wheat. There had been a marked improvement in every department. The occupation of the agriculturist was the most honorable, independent and most conducive to happiness of all the employments of mankind. He who tills the soil which God made and converts the sunlight and dews of heaven into a bale of fleece or cotton or a sheaf of golden wheat, had obeyed the divine command, and, besides, had contributed to the wealth of the world.

Power and Variation of Plants.

(N. Y. AGRICULTURAL EXPERIMENT STATION.)

BULLETIN NO. LIX—SEPT. 5.

The power exerted by growth is something surprising. In the experiments by President Clark upon the squash, this fruit in growing was able to raise 4,125 pounds, and carried for ten days 5,000 pounds without injury. The frequent displacement of flagging stones, and the injury often done to pavements by the roots of shade trees, make it evident that growing roots of firm wood exert, under suitable conditions, a tremendous mechanical force.

The power exercised by an annual root is also exceedingly great, as shown in a case of a long blood beet planted at the Station, in an inch drain tile set upon end and buried in the soil. This drain tile was split length-

wise with the greatest ease as the root outgrew its accommodations.

One of the best roots planted out for seed has presented a novel feature in growth. Instead of throwing up a seed shoot it emitted branches from the root, and these branches coming to the surface, threw out leaves, thus forming a cluster of roots, which at date have grown as annuals, showing no tendency toward seedling.

We have this year among the Beauty of Hebron potatoes, one plant which has developed tubers in abundance in the axils of its leaves. In one axil is to be seen a branch which has swollen in three places into tubers, in no wise appearing, externally, different from a normal tuber, save in the green color produced by exposure to the light.

In this case rust, or blight, has affected the leaves of the plant, and is also to be seen upon the tubers, thus affording rare opportunity of noting the progress of the rot upon the tuber. So far as a casual observation can extend the leaf blight and tuber blight affect both tuber and leaf in the same manner, and whatever differences are later observed come from the difference of the structure of the affected parts rather than from any especial difference in the fungus growth.

In observing the many varieties of the potatoes planted side by side, we cannot but note the variations in habit of growth, habit of tuber formations, and resistance to blight, as apparently inherent in the variety. In some varieties the tendency in the tuber to appear above the surface is strongly marked, in other varieties the tubers remain below ground. Some varieties are already infested with leaf-blight while adjoining varieties are entirely free from it. It is at present too early in the season to offer conclusions, but it is probable that variety differences are to be considered in whatever directions we may have to offer relative to the growing of the potato as a field or garden crop. Thus in notes made upon 102 plantings, some 80 or more varieties, 3 at date show very much potato rot, 23 show much, 33 are scarcely suffering, and 43 are not as yet affected. It seems scarcely desirable at this early period of report to name the rot-resisting sorts, as this will be done far more effectively at a later date.

As this bulletin deals with variations, we may mention that one plant of a row of seed onions of the White Globe variety, has sported into a top-onion, the cluster of small bulbs replacing the normal flower formation. These little onions resemble the parent form in all but size, and the occurrence shows how new, and apparently divergent, varieties can at once appear.

A row of wild carrots, from seed gathered last fall, has yielded all annual instead of biennial plants. Rows of sorghum and safford, grown from seed collected from plants which were annuals last year, are furnishing annual plants this year, thus illustrating how easily and quickly the habits of some plants

can be changed through the art of selection. It is probable that a check to a biennial plant has a tendency to hasten the seed-bearing, and unpropitious circumstances may seem at times to almost change the nature of a plant through the shortening or obliterating of periods of growth. Yet while types may be disguised they can be usually recognized even through apparent changes, when carefully and intelligently sought after.

E. LEWIS STURTEVANT, Director.

Changing Seed.

Many farmers of our acquaintance are accustomed to change the seed of their small grains, corn and potatoes, occasionally; more particularly that of grain and potatoes. We think it a good plan. Whether from careless habits of selection, or from being grown year after year upon the same soil and location, causes their deterioration, is not so clear, nevertheless a change of seed of the various grains and roots upon the farm is most always attended with beneficial results. Growing the same crop in one locality from the same seed, year after year, often tends to deterioration. It is said that the oat grown in the cool atmosphere and soil of Maine and New Hampshire is found to grow more luxuriantly when sown in the Middle and Western States, and uniformly turns out heavier weight to the bushel. If the same seed is sown year after year, in the latter States, without new importations, the produce per acre and weight per bushel gradually deteriorate.

The same rule is applicable to this grain and also rye imported from further South to the colder North, as we know from experience. The farmers of Bermuda always grow their potatoes from American seed, and in many sections of the South, Maine potatoes do duty as seed, by which our city markets are supplied with the early vegetables in advance of our own crops.

The farmers of England, who raise excellent cereals, roots and grasses, are very particular in the selection of seed, procuring it from a foreign country if possible. In the north of Ireland, where flax is grown extensively, a country renowned for its beautiful Irish linen, the farmers prefer seed brought from Russia or Holland, to that grown by themselves, as they find the change very beneficial.

Those conversant with the vast business of our seedsmen and florists, know that the finest bulbous and tuberous rooted plants are annually imported to this country from Holland and Germany.

While this is the existing state of things, and in view of all these facts, we are not prepared to say that if sufficient care was taken by our farmers in the growing and selecting of the grains and grasses to propagate from, far better results might be attained than are at present. Take corn, for instance. If the same system was pursued with that as with our small grains, the same fault of deterioration, would, we doubt not, be apparent. But no one thinks of going to his crib, to shovel up a basketful of corn indiscriminately, and shell it out for seed. The farmer carefully selects the best ears at husking time, and saves them by themselves from which to procure his seed the following season. And so the best is selected year after year, and instead of deteriorating, the corn crop is improved in earliness, productiveness and quality. What the same rules, applied to the small grains in the way of selection for seed, would do, doesn't seem to be so hard a conundrum.—*Lewiston Journal*.

WHEN wet weather makes digging ditches impracticable, it is an excellent plan to mark where underdrains are needed. Unhappily on most farms failure of crops indicate the places plainly enough, and very often the crop that failed would have fully paid the expense in one year.—*Ex*.

Our Mineral Productions.

The chief of the Division of Mining Statistics, Technology and Geological Survey of the United States has just given some figures respecting the mineral production of this country during the year 1882 and the first six months of 1883. One may derive some idea of the extent of our mineral wealth from the fact that during the year 1882 the value of the metallic products was \$219,756,004, exclusive of the mining productions. This is a very large amount, and we can get an idea of the extent of our industry when the fact is revealed that not until the year 1882 did the value of our exports or imports reach that figure. Iron heads the list of the mineral productions in point of value, the spot value of pig iron for that year being \$106,336,429, and for the first six months of this year the value of the same was \$60,024,226. Silver stands next in the list in regard to value, its coinage value for 1882 being \$46,800,000. Gold once second and probably first in regard to value thirty years ago, is now third, its coinage value in 1882 being \$32,500,000. Copper is fourth in the list, with a value of \$16,083,091. Lead follows with a product valued at \$12,626,550; zinc, \$3,646,620; quicksilver, \$1,487,537. But coal constitutes the most valuable product of the mines, its value for 1882 being \$146,635,581, and for the first half of the present year \$69,025,226. Some of the other non-metallic products taken out of the bowels of the earth are lime, \$31,700,000; petroleum, \$23,704,698; salt, \$4,320,148; cement, \$3,572,750. The total value of non-metallic products in 1882 was \$226,156,402, which added to the metals makes an aggregate of \$445,912,406. Thus it appears that the subterranean wealth of this country is a large factor in our industrial greatness.

Improvement in the Management of Our Fairs.

We have often thought that the manner of making the stalls for horses and cattle at our Agricultural Exhibitions could be improved upon to the manifest gratification of all who attend them, and we are gratified to find a suggestion upon a branch of the subject is being brought before the managers of the Fairs of the West, by the influential editor of the *Breeders' Gazette*, who says:

"One of the needs of the hour in connection with all American shows of live stock, is better facilities for public inspection of the animals on exhibition. All fair-goers are cognizant of the difficulty of obtaining 'a good look,' especially in the horse and cattle classes. Stalls are either locked up tight, or animals are so covered with blankets as to render a satisfactory examination out of the question. Of course exhibitors have some rights in this regard which the public should respect, but there is something radically wrong in the system of fair management now in vogue. Except one be present at the time the various rings are being judged, it is next to impossible to form any conception of the character of the stock on exhibition. Why may we not copy with advantage from some of the trans-Atlantic shows? At the 'Royal,' for example, all the animals in the horse and cattle classes must be brought out each day and paraded around three or four times in front of the amphitheater, so that every visitor can get a good look at them. In addition to this, a sign is erected, which tells, plainly, just what class is being paraded; and then each animal wears its number on a large card suspended by a cord or ribbon from the neck. The bystander, catalogue in hand, can then turn to it and get all the information he may desire about the name, age, ownership, breeding, etc., of any animal about which he may desire to obtain such information. This is certainly a most desirable feature, and might readily be adopted

by both the Chicago and Kansas City Fat Stock Shows. There is ample time, after the closing of the entries, for the publication of a catalogue, and the sales of such a work would amply repay the outlay, to say nothing of the additional satisfaction which such a thing would give to visitors.

"During the writer's visit at 'The Royal' Show at York, in July last, he was more impressed with the value of this cataloguing of the animals, and the daily parade, than with anything else connected with the management. It will be a long step in the right direction when our most important stock shows or fairs shall close their entries long enough in advance of the opening day to enable them to adopt this system. Our exhibitors could soon be educated up to it, and all will be pleased and interested by it. It would happen here, as in Great Britain, that animals will be catalogued which, from various causes, may not be shown; but this is only a trivial objection, compared with the great benefit to be derived from the publication of such a catalogue."

The recommendation thus made by the *Gazette*, was predicated upon the announcement made by the Kansas City (Kansas) *Indicator*, where a fat cattle show is to be held this fall also, as well as that at Chicago, that "an exhibition that will be well worth traveling a long distance to see will be the procession of about 600 thoroughbred cattle on the streets of Kansas City, on Thursday, November 1st, the opening day of the Fat-Stock Show. The breeders of polled cattle promise to furnish about 300 head of this unprecedented street parade." This is a step in the right direction.

Live Stock.

Fattening Cattle.

If it be the fall of the year it will be well to begin with the wastes of the farm. The pumpkins, squashes, small potatoes, turnips and even apples, if given in small quantities, may be utilized in this way to good advantage, not only because they are wastes of little value otherwise, but also because by loosening the bowels and quickening the secretions, they help to bring the cattle into a thrifty condition. If such food does not fatten, it is the best preparation for a course of fattening food. A single week of such food, with good hay, will make the animal look better, though it may not have gained a pound in weight. The giving of meal should begin from the first, and perhaps a good rule would be to use about thirty pounds of hay, fifty pounds of roots, and five quarts or ten pounds of meal for every thousand pounds of live weight. The proportion of the amount of food required to the live weight of the animal is not invariable, as the coarse, unthrifty, paunchy ox requires more to sustain life than such a one as described above would require to keep it fattening rapidly. Here the eye of the feeder needs to be trained again, and it needs to be on the alert to detect any symptoms of being over-fed or of a capacity to take more, and after a while the grain rations can be increased and the ration of hay can be reduced accordingly, the object in view all the time being to convert as much hay and grain into beef as can profitably be done.

To keep the cattle thriving it is important that they be kept comfortable and quiet. They will do better if kept in their stalls most of the time, if they have good beds, and the stables are well ventilated so as to furnish them pure air and at the right temperature—neither too warm in summer nor too cold in winter, though they will do better in a place comfortably cold. The stables should never be cold enough to allow the manure to freeze on the floor behind them, or water freeze in front of them. They should have pure water twice a day, though while eating the roots they will require but little, and it will be

better to feed the roots before offering the water, in order to induce them to get along with as little water as possible. Some feeders give no water while fattening on roots and pumpkins, but this seems cruel, and it is doubtful if the animals thrive as well as if allowed water. It is not well to give salt while fattening, unless with a view of creating thirst, which they will quench by eating more roots, or it may sometimes be added to the meal if they appear to have got a little "off their feed" by having been fed too liberally. But when they have been overfed the best remedy is a total withdrawing of the grain ration for one or two meals, and perhaps a little more exercise in the open air.

The manner of feeding is of equal importance. Adopt regular hours of giving food and do not vary from them, except that in the fall and winter the morning meal may be given at a later hour and the evening meal earlier as the days grow shorter, while as the days grow longer the hours for morning and evening feeding may be made farther from the noonday meal. Avoid as much as possible disturbing fattening animals after they have lain down at night. The practice of "feeding round" the last thing before going to bed is a bad one, for if the cattle have had a reasonable allowance at the usual supper hour, they do not need to be called up to eat again any more than the farmer himself needs it after he has retired for the night. Going to the barn to see that all is right there is well enough if the cattle are used to such visits, and do not associate them with the idea of being called up to eat or being driven up for any other purpose.—*American Agriculturist*.

Sending Cattle to the South.

It has been considered a risk to send cattle to the South from the more Northern States earlier in the year than October or November, on account of the danger from the climate. The prosperous condition of that section now, and the increased interest paid to live stock renders a warning in this connection not untimely, as it is probable that large purchases will be made of many classes of improved stock during the next year. In a communication to the *National Live-Stock Journal*, Mr. A. B. Allen refers to the subject as follows:

"As October and November are the most proper months for sending cattle to the South, I will here, for the benefit of all concerned, give a few directions, furnished me, in 1842, by the late Col. Wade Hampton, of Columbia, South Carolina—father of the present Gen. Wade Hampton, of the same place, and now United States Senator. He possessed a large plantation, and was a successful breeder of Shorthorn cattle, thoroughbred horses and fine sheep and swine. He says:

"All cattle imported from England and our Northern and Western States, are liable to be attacked by a fatal disease which I take to be inflammation of the brain. Cattle from eight to twelve months old are less subject to it than those more advanced in life. If they survive the following summer and autumn, I consider them safe, although special care should be taken of them the second season. They should be brought into the South as early in autumn as possible, kept in good growing condition through the winter, and in the spring be removed to a high, healthy position, have easy access to pure water, and their pasture as much shaded as the nature of the ground will admit. In August and September they should be kept in a cool stable during the heat of the day, and at night also, the dew at that season being almost as injurious as the intense heat of the sun. With these precautions, I think more than half would escape the disease, the first indication of which is usually a languid appearance of the animal, followed by the loss of appetite, short, quick breathing, with more or less fever, and not unfrequently accompanied with a cough. I have heretofore considered this disease incurable when once fully established."

To the above I will add, that as late as May and as early as September, I have found

it excessively hotter in lower Southern latitudes than in Columbia, so that in these it is not advisable to send cattle to arrive there earlier in the season than November, or later than February. In such latitudes, also, they ought to be housed from the last of April to the last of October, moderately fed with fresh-cut grass or clover, rye and oats, when in blossom, or at least before the grain becomes hardened at all, sweet Indian corn, or amber cane, or sorghum, as soon as tasseled, and give all the pure water they will drink, morning, noon and night, or still oftener when a spell of very hot weather prevails. Thus kept, the cattle cannot get at pernicious weeds or water, and by darkening their stables, they are freed from the sting of insects, which is often the cause of death.

The quick breathing, accompanied with fever, of which Col. Hampton speaks, is owing to the increased pulsation, which always attends the bovine species when transferred from a cool to a hot climate. It generally doubles, and remains so for some time after this change of location. I have been informed that hornless cattle endure a hot climate much better than those with horns; and in order to save the latter from the fever when attacked, the shockingly cruel remedy of sawing off the horns has been prescribed.

There are many very pretty Red Polled cattle in the lower part of Georgia, and I presume in other Southern States. If some young Norfolk or Suffolk Red Polled bulls could be imported from England to cross on these cows, a very fine progeny would be the result, for these are celebrated as being a generally useful sort, like Shorthorns, superior alike in the dairy and for the shambles. When executing orders for cattle to be sent from the North to the South, I invariably refuse to fill them, except during the season from last of September to the fore part of March, according to the climate there."

Food for Fattening Sheep.

The most economical and appropriate combination of food will depend upon cost of different foods in the locality. Nearly all the grains raised are healthy for sheep underground, except millet, and this is not economical, and probably not healthy; fed underground, because of its small size and hard husk, it is not masticated and is not digested, but mostly passes through the animal whole. Millet should be ground before feeding.

Rye, oats, barley, buckwheat, peas, beans, Indian corn, wheat, bran, shorts or middlings, and oil meal, are each and all good food for fattening sheep—but sheep should not be fattened upon a single food, as they are fond of variety, and will gain faster when allowed to have it. Sheep are so fond of succulent food, that they will pick over large fields, in open winter, trying to find it. They suffer when kept wholly on dry food for several months, and, for this reason, the last food mentioned, oil meal, should be provided in small quantity for them. It is not usually dearer, according to its feeding value, than other foods in the list. Lined meal has a very soothing and healthful effect upon the digestive organs, and one and a half pounds to each sheep, per week, is worth all it costs as a promoter of health. It seems to have an effect similar to turnips, when sheep are upon dry food. Corn is too heating to be fed alone, but when fed with one-half pound of oil meal per day, it does not show any of its heating effects. Therefore, if corn is cheap, it may be the most economical to feed 1½ lbs. corn with this small amount of oil meal. Bran and middlings are often very low in price, and when this is the case, and corn is also low, 1 lb. of middlings and 1 lb. of corn may be fed, or in equal parts by weight. As a single food for fattening, oats is probably

the best. The ten to twelve pounds of husk on oats per bushel, is what renders this food healthier than the more concentrated food, corn. This husk renders the whole porous in the stomach, and thus more easily saturated by the gastric juice. Besides, oats are a nitrogenous food, and supplies the animal wants for this element, but oats usually bear a proportionally higher price in market, and may often be too dear to feed.

The feeder cannot err in giving too great a variety in the food of sheep. The best ration we have ever known fed to fattening sheep was composed of equal parts by weight of oats, corn, peas, and millet, and to fifteen bushels of the mixture was added one bushel of flaxseed, and ground fine together. Each sheep was fed two pounds of this ground mixture with hay, and made a regular gain of three pounds each per week, besides growing an unusually fine staple of wool. This small amount of flaxseed is peculiarly soothing to the digestive organs. It is a perfect preventive of all diseases caused by dry fodder. Such a ration as this may be considered quite impracticable upon a Nebraska winter corral; but since much of the food must, usually, be transported by rail or water, we would suggest that this ration, or something similar, may be compounded and ground at some milling centre, and then shipped to the place for use, costing no more than to ship the raw material.

Sheep may be fattened just as well on such a ration as this with straw for coarse fodder, requiring only a slight addition to the grain ration. When it happens that corn is fed alone as the grain food, it is well to put hay in the rack, and then spread the shelled corn on the top of the hay. The sheep will eat the corn as it falls down into the trough with the fine parts of the hay, and in eating the corn, will also eat hay with it; thus bringing the masticated corn into the stomach mixed with the fibrous hay, rendering it more porous for the easier action of the gastric juice. All ground feed at the winter corral will, of course, be fed dry.

We hope these suggestions may be of service to some of the winter feeders of sheep on the Far Western ranches.—*Nat. Live Stock Journal.*

The general treatment of the narcissus in the open ground is about the same as that of the Tulip. By reason of its fragrance, as well as its many beautiful varieties, and its re-blooming, it is quite desirable for home culture. The Jonquils are the most sweet-scented, and are favorites for potting on that count.

In potting Narcissus bulbs it is best to keep the neck or top of the bulb even with the surface of the soil; three or four bulbs an occupy a five or six-inch pot. With proper management the flowers can be had by the winter holidays. To do this the bulbs should be potted about the first of October, the pots set away in a cold-frame, or in some dark corner, and covered at least a foot deep.

Sheep Farming.

Despite the constant attention which is called to the value of sheep, not only as improvers of the land, but as profitable farm animals, for wool and mutton, there are many farmers who have never raised or kept a single sheep, though their farms are adapted to raising sheep largely and profitably. Why this is we cannot imagine, for facts and figures can be had by the score to prove the profitability of sheep breeding, if necessary, and about the only drawback in many localities is the loss occasioned by dogs. Many a rough, wornout or neglected farm might be brought up rapidly and be made paying land, by breeding sheep thereon, as the manure from the sheep is one of the most enriching of manures, and is evenly, finely distributed. Of course they may not do this without being fed something besides what they can get in

the fields, yet this additional food works to the profit of the breeder in two ways—it not only insures good and profitable growth of flesh and wool, but it makes the manure richer and more valuable. Even poor farmers can give sheep a trial by commencing in a small way, and then, as means and experience are gained, the flocks can be gradually increased by purchases, though the natural increase from a small flock of sheep is by no means inconsiderable, if properly managed and cared for as they should be. Like any other stock, they must have good care and food to secure the greatest measure of profit.—*Farm and Garden.*

A French Chapter on the Pig.

From our Correspondent in Paris.

The pig is a truly singular quadruped by its shape and habits. It was introduced to the New World by the Spaniards, and is now at home in all climates. It is contented with anything, provided it be full; it is easily reared, and invaluable in country towns far away from supplies of fresh meat. The ancients and the Easterns hated the pig, and it is still rare in Asia. Moses it is surmised denounced the pig because the Jews, being an agricultural, a pastoral people, might neglect other domestic animals for the convenient pig. Others allege the pig was proscribed from a belief that its flesh engendered leprosy—a malady common to Egypt and Arabia, something akin to measles and trichine of to-day. Montesquieu thus defends such a good local law. Saint Clement asserts Moses prohibited the pig because in rooting it destroyed grains and vegetables, consequences sharply felt in Palestine, where the soil is but little arable and only 4 or 5 inches deep.

The flesh of the pig does not differ from that of other animals, only if eaten in excess it produces indigestion and may induce contagious diseases. It is selected as the type of stupidity, which is not quite exact in presence of the many "learned pigs" on record. It will follow the person that feeds it: in Germany, when the herd arrives in the village to collect the pigs of subscribers to feed in the forests on mast, he rings a bell, on hearing which the animals arrive in a scamper and fall in. The pig defends its young ferociously, and when followed they run up to embrace the mother before selecting a steat. When the Duke of Lancaster laid siege to Rennes, Captain Lafort had only one sow left to feed the garrison, while the English army had quite a herd of hogs. At night the captain let down the drawbridge, and it had the sow driven towards where the English pigs were parked: they heard her squeak, followed the cry, and 2,000 crossed the drawbridge, which was drawn up, and thus saved the garrison.

The variety of pigs depends on climate and food. In warm climates they are generally black as wild boars; in cold climates, white. The long-eared race is peculiar to Westphalia, a region celebrated for its hams. Brown pigs are considered as most liable to measles. In Italy the Parma pigs are in repute; they help to make the famous Boulogne sausages, they are black, short in legs, and run so rapidly up to fat as requiring to be raised up to be fed. The Normandy race is similar in these traits, only it is white. In the latter country the boar can serve at eight months, and is allowed to continue so till two years; 16 to 20 sows are allowed, which is excessive. At two years the boar becomes vicious, and so farmers break his tusks in the lower jaw. The sow preferred for breeding should have long sides and be of quiet habits. The pigs should be kept warm and clean, they will never fatten in dirt. In many styes a scratching post is erected and plenty of fresh water supplied. A little leaven is frequently placed in the trough, as pigs like the acid or fermented relish. Burned oats are given to

make the sow take the boar, and November to May is the season preferred for such. To prevent the mother from eating her progeny she is fed well a few days before farrowing, and her back sponged with aloes. The sow is allowed to breed at ten months till five years.

THE CROPS.—The outlook for farmers is not promising—save for potatoes. The harvest in course of completion will be less than last year by a fifth to a third; beets are running into leaf; the vintage will be more abundant than in 1882, though the oidium has appeared in Burgundy. As for the phylloxera nothing stops its march; the planting of American vine stocks is rapidly extending.

The Dairy.

Dairy Products in Baltimore County.

The specimens of butter offered in competition at the Timonium Fair were more numerous than usual, outnumbering those of last year five to one, and were noticeable for quality as well as quantity, which was the result in part of the wisdom and liberality of the managers in offering special premiums. And where was the garlic, so objectionable last year? In all the fifty exhibits, numbering more than an hundred pounds of butter, not a trace of garlic taste was to be found, except in one parcel, and that taint was very faint. Surely this is a long stride towards perfection, and should be a source of much gratification. In the class for children under 16 years of age, there were 14 entries, and many of them, if not all, would have reflected credit upon men and women. We would suggest to the management to specify that the rolls and prints should be made at the same time if they offer special premiums next year for this class. One of the successful competitors in this list would not have been so successful had this been one of the conditions at this show. In the class for butter of "a week old," the competition was very close, as might be expected where twenty-one very creditable parcels were offered, and fine discrimination had to be used; several of the specimens would have passed for very fresh butter; three of the specimens, however, distanced the rest, and there all the points—appearance, marketable worth, texture, color, fragrance and taste—had to be tested critically before a decision as to excellence could be arrived at. Two very good specimens, otherwise, had been churned too long or had been worked too much after they came from the churn, for they had a salve consistency and were without a clearly defined grain. Several specimens of fanciful shapes or forms of butter added to the beauty of the display, and suggested that a class should be opened for competition in that particular. Taken all in all, Baltimore county has never had such a fine display of butter at any exhibition, and the people will be proud of the exhibit of 1883. E.

Training Heifers to Milk.

In the *FARMER* of August 1st is an article on the above subject, and the author says, "this is sometimes called 'breaking', but the term is too harsh," and then goes on to tell how to "break" a heifer. I "train" my heifers, commencing when they are very young, say a week old, and go through all the motions of milking, handling the udder, pulling the teats and rubbing the legs, and in fact "handling" her all over. The result is that when she drops her first calf she is thoroughly "broken." One of my heifers calved yesterday and I can milk her from either side or behind and she does not think it anything out of the usual order. I would suggest caution in pulling the teats of heifers before they calve, as there is danger of bringing them to milk before their time. Any one trying this plan will never have to "break" their heifers. A. L. CROSBY, Rockland Farm, Baltimore Co.

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Woodlawn Agricultural Society.

Messrs. Editors American Farmer :
The seventeenth anniversary of the Woodlawn Agricultural Society was held August 13th, at Woodlawn Mansion. The election of officers for the ensuing year and other routine business was attended to in a hurried manner in order to listen to addresses from several well known speakers. Henry C. Halliwell of Sandy Spring was the first speaker who entertained and instructed in his easy happy style.
Dr. M. P. Ellzey, of Washington addressed us on the subject of commercial manures. It was listened to with undivided attention by all who are interested in such matters. It was considered of such practical value that his manuscript was obtained for publication, and is forwarded herewith. Although vehement denunciations of the frauds practiced upon farmers by some manufacturers and their agents are not in the written address, yet there is enough of warning in it to caution the farmer in his purchases.
Gen. Fitzhugh Lee gave us the closing address, the desert of the east, which it is to produce the effect of the living orator.
The large numbers present on one of the most lovely days of the season appeared to enjoy themselves both physically and intellectually to the fullest extent.

N. W. P.

Address of Dr. W. G. Ellzey on Commercial Manures.

I shall make no apology for detaining you at some length, because the subjects I am to attempt to discuss are of vital importance to farmers. I hope to be understood as discussing the use of commercial manures as a part of a system of agriculture, not as a makeshift to obtain a great crop regardless of the cost of production and regardless of the condition in which the land may be left for the growth of future crops. If we grow paying crops and at the same time improve our land, we are farming scientifically, otherwise not. Combined nitrogen and phosphates are of all fertilizing materials most important, for they are at once the most costly and the most deficient, naturally, in our soils—nitrogen especially being also most subject to be leached out of the soil, and so completely and finally lost. Next in importance is potash and lime. In the first place, I invite attention to a few general facts and principles as a basis of mutual understanding as I proceed with the arguments I purpose to bring forward. The elementary constituents of plants are thirteen in number. Four of these substances are the common gases, oxygen, hydrogen, nitrogen and chlorine; five of them are metals, viz., potassium, sodium, calcium, magnesium and iron; four are metaloids, viz., silicon, phosphorus, sulphur and carbon. These thirteen elements are essential to agricultural plants, and substances consisting of varied combinations of them constitute plant food. Each and every one of these substances enjoys a practically universal distribution at the surface of the earth, as does also aluminum, the basis of clay, important to the physical texture of soils. No other substance does—a fact not explainable by evolution, hypothesis or nebular theory; a fact wonderful in itself, but not accounted for by any modern atheist or infidel.

Now please observe, that so far as is known, no plant can, under any circumstances, assimilate or utilize as a portion of any of its structure any one of the elements named in its full or uncombined states. I said, therefore, with a definite purpose, that plant food is composed of substances formed by divers combinations of the elementary substances named as entering into the composition of their structures. The nutrition of plants is accomplished by the decomposition of compound substances, mainly oxides, and the recombination of the elements thus set free into the tissues of plants by the physiological forces of the plant. This is an important general law. I invite your attention to it.
We have first chemical combinations of the elements according to chemical laws, forming the substances upon which plants feed, then the decomposition of these compounds into their elements of physiological structures in accordance with physiological laws. The physiological forces are not merely a sort of physico-chemistry, as so often stated to be. They are capable of reversing both chemical and physical laws and subordinating them to the uses of living organisms.
If a plant be burned in the air, 95 per cent. of it will disappear in invisible gasses, diffused into the surrounding air; 5 per cent. of it will remain unburned, constituting the ash.
The combustible parts of plants are composed of four elements, viz., carbon, hydrogen and nitrogen. The ash is composed of nine elements, viz., potassium, sodium, calcium, magnesium, iron, silicon, chlorine, phosphorus and sulphur; these last are conveniently termed the ash minerals. The carbon, hydrogen and oxygen of plants are derived from the carbonic anhydride and water everywhere present in the air and in fertile soils in quantity superabundant for the uses of all agricultural plants. The nitrogen of plants is derived from nitric acid, possibly in part from ammonia. These substances exist also everywhere in the air and in soils, but not in quantities sufficient to supply the waste of constant cropping, as demonstrated by experience.
The ash minerals exist in all soils, as stated, but not, as frequently supposed, in inexhaustible supply. Experience, that great teacher, demonstrates that the phosphates are especially liable to be or to become, after continuous cropping, deficient for the full needs of our cereal crops. In like manner and in some soils, potash and lime are deficient.
It is true, as I have already stated, that phosphates and nitrogen compounds are the substances of chief importance in commercial manures. The phosphoric acid utilized by plants exists usually and mainly as phosphate of lime. It combines in several portions with lime. One equivalent of acid combined with three of lime, forms the so-called tribasic or tricalcic or "bone phosphate of lime." This form is insoluble in water, and only when very finely pulverized soluble to any extent in solution of ammonium citrate. When finally ground, I have evidence that tricalcic phosphate is soluble in ammonium citrate, and when finely ground and properly mixed with kainit and other materials of that sort, it is largely and freely soluble in ammonium citrate. Combined with two equivalents of base, the phosphoric acid dissolves freely in ammonium citrate, and combined with one equivalent of base, the monocalcic form is soluble in water. Phosphates soluble in solution of ammonia citrate but not soluble in water, have been called "reverted" or "precipitated" phosphates. These terms are without any precise and definite scientific meaning; they are vague and elastic, and therefore misleading and capable of becoming the learned vehicle of much pious fraud. They have been undoubtedly extensively so employed. I know perfectly well what I am saying and am prepared to defend my positions. Inasmuch as all forms of phosphoric acid eventually reach the form of tribasic combination in the soil and become insoluble in and immovable by soil water, inasmuch as the ashes and tissues of all plants contain only tribasic phosphates, it becomes perfectly clear that the importance of the constructions between soluble reverted and insoluble phosphates has been greatly exaggerated by chemists. Hence, I maintain and have long maintained that mechanical disintegration should be and can be substituted for chemical treatment in the preparation of crude mineral phosphates for fertilizing materials, seeing that chemical treatment is more expensive than mechanical in the proportion of \$130 to \$30. It can no longer be disputed that insoluble phosphates are assimilated by plants, the plants themselves effecting their solution and absorption by means of their roots placed in direct contact with the phosphate in the soil. I have not time to quote extensively from authorities, but I ask leave to read a statement from Sir John Bennett Lawes completely corroborative of that position which I have defended for many years. The pamphlet from which I quote, recently published, is styled "An Attempt to Explain the Action of Manures." On page 8, the learned author says: "In one of our permanent wheat fields at Rothamstead, the land receives, with other manures, 3½ cwt. of superphosphate of lime per acre every year. This application has taken place every year for between 30 and 40 years, during which period hardly any phosphate has been carried away by the crops. A few years ago, several analyses of the drainage water passing through this soil, by Dr. Voelcker, showed less than 1 lb. of phosphoric acid to 100,000 gallons of water. A large crop of turnips would certainly evaporate this amount of water if not more, but as the turnips would require a good many pounds of phosphoric acid, it is evident that they could only get the required amount by some chemical action

of the roots when in direct contact with that substance." "It has been further shown," continues this pre-eminent authority, "by direct experiment, that polished phosphatic rocks can be corroded and roughened by the roots of plants in contact with them." I simply reaffirm that in the present state of knowledge no one can pretend that phosphates to be assimilated by plants must be soluble in either water or solution of ammonia citrate. What, indeed, have plants to do with ammonium citrate? As the result of the acceptance of the views stated above in many quarters, we have recently been furnished with ground phosphates reduced to an impalpable form called "floats," as the product of the mill invented by Mr. Duc, of South Carolina, and also ground by burrstones and bolted. Practical experiments with "floats" show that the phosphates in that form are readily assimilated by our crops. As the South Carolina phosphates are the best crude material for the production of "floats," I will, in the briefest manner, describe those vast deposits. The beds extend from the vicinity of Charleston, South Carolina, northward into North Carolina, and southward to Florida. In fact, the southern limit of the formation is probably the New Jersey green sand; and valuable deposits will be found at intervals all along the coast, I have no doubt, when proper and competent search shall be made. Such exploration ought to be made by the United States Geological Survey. Of the aggregate amount of the material various estimates have been made, but it is certain that no sufficient data exist for reliable calculations. The pessimist view is that the accessible material will be exhausted at the present rate of consumption in from 10 to 20 years.
The optimist view is that the beds are "inexhaustible," the word inexhaustible conveying the idea of sufficiency for many years, to meet all the demands which can be made upon the accessible supply. With that interpretation of "inexhaustible," I am inclined to the optimist view. Professor Shepherd, whom I set down as a pessimist, says: "I should say that the total yield of all the phosphatic deposits of South Carolina of merchantable quality and accessible position, would not exceed five millions of tons." I have no doubt this is under the truth. I put it to you my friends that this material is now cheap; that if you get it once on your land it will remain there subject to no waste except future cropping. The future presents the certainty of a final rise in price, even though temporary depression may occur; act therefore in the living present. It is a safe, permanent investment on good terms as the case now stands; one year, five, ten, twenty-five years hence the case may be different. The phosphate beds occupy an area of 240,000 acres approximately, as already known and defined. Shepherd puts down the area which may be profitably worked at 10,000 acres only. It is hardly to be doubted this is too low an estimate, but I must add that Prof. Shepherd is an able man who has made his observations on the spot, and his conclusions are to be viewed in the light of those facts. It

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would be vain in this place to speculate upon the origin of these great beds. The material is obviously of animal origin, in many places composed in great part of fossil bones and teeth of great fishes and reptiles. How came these enormous multitudes of great beasts to die in those places in ages past it is not for man to know; it is for man to gather those bones together and manure his crops with them.

In some places the original form of these remains has been lost and they are now compacted into nodular beds, as it were compact stony floors, miles in extent, varying from 10 to 30 inches thick. The nodules vary in size from a few lines to several feet in diameter. The deposits extend under the river beds and even miles out at sea. That which is dredged up from the bottoms of public waters pays a royalty to the State of South Carolina of one dollar per ton. It is harder, denser, darker in color than the land rock.

The average analysis of these phosphates show from 55 per cent. to 61 per cent. bone phosphate of lime and 5 per cent. to 11 per cent. of carbonate of lime. Organic matter and combined water, and adherent moisture of each, 2 per cent. to 6 per cent. Sand and silica, 4 per cent. to 12 per cent.

The South Carolina phosphate is easily ground and bolted either in the Duc mill, which is a centrifugal apparatus, or between stones; in the latter case being bolted. The fineness of the product is the test of value, for just in proportion as it is fine will be the facility of its distribution in the soil and its assimilation by plants.

Mineral phosphates exist in other parts of the world, and in some places in vast supply. Very hard crystalline phosphates are called apatite, those less hard phosphorite. The Bordeaux phosphates of France are, according to the best information, practically worked out. The Spanish phosphates are of enormous extent and high grade, containing from 75 per cent. to 85 per cent. of bone phosphate. They are remote from transportation, and are hard to grind, but Duc's mill and other apparatus will probably get them into good form, and an inexpensive railroad will one day give them cheap transportation. The German phosphates are of increased importance since the chemical view of the non-assimilation of insoluble phosphates has to be abandoned. I hope and believe that the various European phosphates will soon be able to exclude the South Carolina deposits from all foreign markets and force their consumption at home. I should gladly hail the day when the last ton of them had been sent abroad. We want every pound of them here. Those of us who have already grey hairs upon us here and there, may yet see the day when there shall be one hundred millions of mouths to fill in this country. Already England, Germany and other European States do make and can make less food than they consume, and their populations are still increasing. The bread question is forging its way steadily to the front in humane affairs.

The Canada apatite is a rich phosphate, yielding an average analysis of nearly 75 per cent. bone phosphate. It contains fluoride of calcium, and cannot be treated with sulphuric acid without free evolution of hydrofluoric acid, a poisonous, suffocating corrosive, and dangerous gas. It may prove of value for "floats," and, under a good demand, it may come to yield 50,000 tons per annum to commerce.

Phosphatic guanos are found in divers places. Some of these are pulverulent in form, some are hardened into stone. All of them have lost nearly the whole of the organic matter and ammoniated salts by leaching rains. They retain the insoluble phosphate mixed with more or less carbonate of lime, silica sand and other substances of no value. The super-phosphates made from this class of guanos have a tendency to re-

main in a soft, pasty condition, and they do not suit manipulators. They ought to be applied to the land without the sulphuric acid treatment. The success of the so-called Orchilla guano so applied is a fact that stands out against the theory that the use of sulphuric acid is necessary. It is difficult to obtain exact data about these deposits out along the South American west coast are certainly extensive beds of this kind. In the West Indies are rock guanos of great extent, some of them containing so much phosphate of iron and alumina as to be of little use for super-phosphate, such as Navassa and Rodondo rocks. It remains to be seen how they will act when floated, and especially when mixed with kainit, lime, etc. I look confidently to the abandonment of sulphuric acid in the manufacture of fertilizers for general agriculture.

Super-phosphates may continue to be manufactured on a small scale for special purposes. I believe they will be, I know they ought to be, abandoned by the general farmer. No crop grown either does or can, in my belief, pay for their use. I have examined into the matter from every possible point of view, I am familiar with the chemistry of the subject, and I am perfectly convinced that the long continued and extensive use of either super-phosphates or the so-called ammoniated super-phosphates alone will ruin any farmer. Raw ground bones I believe to be the only fertilizer which used by itself has produced paying crops and improved the land. Those who have used raw bone and fed much stock have made money and rapidly increased the value of their lands. Those who have used super-phosphates and ammoniated super-phosphates and tried to make money by selling corn and wheat and tobacco, are mostly insolvent, and their impoverished lands have been hawked off at auction by the sheriff for a song. Sir John Bennett Lawes compares the treatment of phosphates with sulphuric acid for turnips to cooking soup for a hurried and hungry traveller. Now, I say taking that view of the case, the cook's hire is too high. It will break us all up to feed any crop we can grow here on that sort of soup. It will cost us \$100 to cook \$30 worth of Lawes' phosphate soup. The soup may be good, but who is able to pay the price? I take my stand upon this proposition: we must dispense here with sulphuric acid in the preparation of phosphates for our crops and our lands, or we shall all go to the wall.

How the case may stand in England or elsewhere I know not, but I do know that no system of farming here will justify the expense of super-phosphates, ammoniated or not, as a main reliance for the production of paying crops and the improvement of the land. For phosphates, we must rely upon bones and floats; for nitrogen, upon green crops and animal manures as the basis of any system of farming by which we hope to make a living and improve our lands, and if we cannot hope to do that, why farm at all, seeing that ultimate bankruptcy stares us in the face. Must we toil on forever to no purpose, and dying, leave our children in want, while that which was ours by inheritance passes to the children of the manufacturer of sulphuric acid? Things have been going that way at a great rate hitherto. It is high time to turn back. Let us compare the floats and other insoluble phosphates. Orchilla guano contains the phosphate in the same form as the floats. It contains 43 per cent. of it, the floats contain 60 per cent. of it. Orchilla costs \$80 per ton, floats cost \$18. A ton of Orchilla super-phosphate costs \$75 or near it. The phosphate in the Orchilla and the floats is in the same form as in raw bones, and in the old Peruvian guano, in dried blood, in fish scrap, in wood ashes, in green crops and farm-yard manure. Do I say too much to you farmers when I say that is a good form?

About potash, I have only to say that on

stiff feldspathic clays it can be but carrying coals to New Castle to put potash. On all light, sandy, magnesian and chaffy land it will pay to put potash. I recommend you to try a mixture of two-thirds floats and one-third kainit, apply at the rate of four hundred pounds per acre broadcast on the rough and harrow in as a preparation for wheat. If practicable, apply that mixture in April or May to a fallow crop, clover or peas, to be turned under in September for wheat to be seeded by from the 10th to the 20th of October. If the wheat does not show well by the last of March, top dress with 100 lbs. per acre of nitrate of soda. On your corn, apply 400 to 500 lbs. per acre of phosphates and kainit mixture, per acre broadcast on the rough and harrow in. Follow the corn with wheat or oats and top dress during winter with stable manure. In spring, seed to grass and dress with 100 lbs. per acre of nitrate of soda. On fallow wheat land it will be a good plan to apply at least every other time in rotation, besides the phosphate-kainit mixture, 25 bushels per acre air-slacked lime, scattered on the rough and harrowed in. I put some lime on new land, near Fairfax Courthouse, and doubled the yield of corn. Your lands in this county are deficient in lime.

As to nitrogen, I must condense all I have to offer into a few pages. I have said that crops get their nitrogen mostly from nitric acid; that fact is certain. Ammoniated salts cannot long exist in the soil as such; they undergo rapid conversion into nitric acid and other products. So does the nitrogen of organic matter move slowly. This is accomplished by the agency of the nitric ferment. The nitric ferment is a microscopic vegetation, subterranean in its habitat, classed with the yeast plant, and producing as the result of its assimilative activity nitric acid. It converts all forms of combined nitrogen into nitric acid, but more speedily converts the ammonia salts than organic compounds or nitrogen combined with carbon. Neither the ammonia salts nor the nitrogen of organic matter suffers any waste by leaching, but nitric acid does leach out rapidly and soon appears in the drainage water, combined with lime or other basic matter. I mean by basic matter, substances capable of combining with an acid to form a salt. It thus happens that the nitric acid appears in the drainage in the form of nitrates, so not only wasting itself, but becoming the vehicle of an important part of the ash minerals of the soil and deporting them also. It is exceedingly important, therefore, to understand fully the history of combined nitrogen in the soil. The laws which govern the activity of the nitric ferment are very well known. When the temperature declines 40° F. it ceases to act, as it does also when on the other hand the temperature rises above 140° F. It is most active at 98° F. and its activity declines somewhat rapidly as the temperature rises above or falls below 98°. In a full strong light, with free access of oxygen, its activity is much impaired or altogether destroyed, hence its subterranean habitat. The functions of the nitric ferment in nature is to transfer the nitrogen of organic matter from its insoluble combination with carbon to a combination with oxygen, forming nitric acid, soluble and assimilable by plants, whereas the same decline of temperature which at the approach of winter arrests the growth of crops, arrests also the formation of nitric acid, and the waste which would otherwise occur is thus prevented.

I have already stated that the nitric ferment likewise transfers the nitrogen of ammonia salts from its combination with hydrogen to oxygen, forming nitric acid. Here then we come upon one of the most beautiful and important of the great series of checks and balances upon which the perpetuity of the universe depends. If we apply nitrogen to our fall-sown grain in the form of nitrates, as nitrogen of soda, the plants will take up

only a very small portion of it before the frosts of winter check their growth, but during the winter washing rains and melting snows will carry a very great portion of the residue of the nitrates into the drainage water and it will be lost. In this way, beyond dispute, millions of dollars have been lost by farmers. Nitrogen is cheaper in sodium nitrate than in other commercial forms, hence that substance has been largely used to "fortify" the analysis of so-called ammoniated super-phosphates as "wheat manures" of the various manufacturers which are universally applied in the fall, and often late in the fall at the very verge of winter, a practice wasteful and ruinous. Now those chemical analysis, which are to protect the farmers, report this nitric acid as ammonia, or as nitrogen-yielding ammonia. The farmer pays 30 cents a pound for it, and then casts it into the ditch water and sees or hears of it never again. This is the law: put no nitrates on fall-sown crops; top-dress with them in the spring, the latter half of April in this locality. When we reflect upon the fact that the wheat crop matures within six weeks after the nitric ferment begins to be active, we should have no difficulty in comprehending why this crop needs such large artificial supplies of nitrogen. Whereas corn, cotton and tobacco cover in the period of their vegetative activity the whole period of the activity of the nitric ferment, including July, August and September, its period of greatest activity; therefore, we do not wonder that corn, cotton, tobacco, clover, etc., do not need artificial supplies of nitrogen, and, as a matter of fact, experience demonstrates that they are little benefitted by any nitrogenous manure. Nitrogen purchased at 30 cents per pound to apply to a crop not benefitted by it is a costly waste, because a great part of it will be lost before the land is occupied by a crop which can utilize it. It may be stated as a rule that nitrates and salts of ammonia are either taken up by vegetation or lost in the drainage water in one season after their application to the soil. Therefore, they are of little benefit to any crop which comes after that one in the rotation to which they are applied. In the light of this fact we comprehend why no improvement but often material damage to poor land results from empirical use of Peruvian guano. It is proven that the most economical way to feed any animal is to supply it with the optimum of food in kind and quantity every day of its life, from birth to slaughter; that the same law holds good of agricultural plants there can be no doubt. We cannot house our crops nor control the seasons, but we can control their food supply and protect them from the plundering of hostile weeds invading their commissariat.

It is in vain that we supply our plants with an overplus of phosphates, potash and other ash minerals when the supply of nitrogen is insufficient. The idea that plants obtain nitrogen from the air by assimilating it directly in its free state is a fatally disastrous error, erroneous in theory and pernicious in practice. It is only combined nitrogen, such as is furnished in manures, which is plant food. Twelve or thirteen bushels of wheat is probably the limit of the capacity of production of our soils supplied with an overplus of ash minerals without artificial supplies of nitrogen. The ash minerals present in that supply which constitutes the optimum or best quantity for the crop, then if nitrogen be present also in the best form and in such quantity as represents also the optimum or that which is best for the crop, then our soils and seasons seem capable of yielding from forty to sixty bushels of wheat per acre. Now if we have the optimum of nitrogen and less than the optimum of ash minerals, remember that the nitrogen cannot be taken up for lack of ash minerals, and that we shall suffer great loss from its rapid waste. But ash minerals will not thus waste (except lime as sulphate), and we may accu-

multate a permanent excess of them in the soil ready for future crops. It is in view of this fact I earnestly press it upon you to accumulate as large a supply of phosphates and potash as possible in your soils while these articles are now cheap. But I warn you against the heavy application of nitrogenous manures to soils in which there is less than the optimum of potash, phosphates and other ash minerals. In so doing you are subject, I say, to various losses from the leaching and permanent waste and loss of that costly substance, nitric acid.

The use of one sided manures is necessarily bad practice which can only in any case accomplish a temporary purpose at the expense of the soil. Let us resolve to abandon now and forever the makeshift, rip-goose system. Let us resolve here and now that we will understand our business as a science, that we may practice it skillfully as an art, and we may rely upon it that the Great God of heaven and earth will continue to send his rain upon the just and the unjust, and that seed time and harvest shall never fail.

Frederick County, Maryland.

Messrs. Editors American Farmer:

In looking over some old papers I came across the following article from the pen of the late Dr. Philip Tyson, State Geologist, on the Agricultural Geology of Frederick county, written in 1858. Though twenty-five years old, it will doubtless be interesting to many of your subscribers in that rich and highly favored county, and serve to convey to strangers a better idea of the wealth and resources of the State.

Dr. Tyson was a most intelligent scientist, and a diligent and painstaking investigator, who was not appreciated in his day and generation, and I fear much of his work has been lost. At the instance of the late Evan T. Ellicott, also one of Maryland's most useful and intelligent citizens, I made an effort in the Legislature of 1862-3 to rescue from oblivion a part of Dr. Tyson's work, but the overshadowing events of the war pushed out of the way everything like scientific research and industrial improvement, and I am not aware that any steps have since been taken to bring to light the many rich and interesting treasures contained in Dr. Tyson's notes and laboratory.

The article I send you may prompt some of the young professors of the Johns Hopkins, who have already rendered valuable service in Maryland history, to extend their investigations into Maryland's resources.

The papers of Dr. Tyson, an old friend and cotemporary of their patron and founder, Mr. Hopkins, would I am sure, render very valuable aid and assistance.

Yours truly, A. B. DAVIS.
Greenwood, August 10, 1883.

Frederick county contains a larger area of cultivated land whose average fertility is greater than any other county in Maryland. The causes of this fertility are well worth a careful investigation. A full knowledge of all the circumstances connected with this interesting subject would fully satisfy our inquiries and indicate the various means by which the products of the soil even of this wealthy county might be materially increased in amount.

It is impossible properly to investigate the causes of the superiority of the lands of this or any other county without a full knowledge of its mineral constitution. This can only be obtained by a detailed geological survey, executed in such a manner as to indicate the chemical and physical characters, and extents of all its rocks or mineral masses at or near the surface. This is evident from the fact that all soils mainly consist of earthy matters, resulting from the disintegration and decomposition of rocky masses.

In order to avoid technical details, it may

be remarked generally that rocks are slowly but incessantly acted upon by the elements of water and the gases which constitute our atmosphere, aided by alternations of temperature. The various chemical and physical actions which ensue, disintegrate and decompose the rocks and bring them at and near the surface to the state of what we call soil, earth, loam, etc. Some of their constituents (as carbonate of lime for instance) are dissolved and washed into the adjacent streams of water, or percolate into the ground to mingle with underground streams. It is owing to this cause that there is no spring, river or well water that does not contain mineral substances in solution. The more insoluble remain and constitute what we call "soil in places."

In localities, over which floods have swept, portions of the soil have been washed off and deposited in places more or less distant, and when elevated above the water level are called alluvial or "transported soils."

Except some points on the margins of water courses, the soils of Frederick county are of the first kind, or "in places." Their characters, therefore, depend upon the chemical and physical constitution of the rocks upon which they rest and from which they were formed.

Omitting those rocks and minerals which are known to exist in extensive areas within the limits of Frederick county. Instead of stating their entire chemical composition, our present purpose will be better answered by a description of such of their constituents as assist in forming the inorganic matter of plants, or the ashes remaining after they have been burned:

1. Talcose slates and argillites or clay slates, which contain the silicates of lime, potash and soda, besides iron phosphoric acid and sulphur; the last being usually confined with iron, forming the iron pyrites so often mistaken for gold.

2. Limestone, which, if perfectly pure, would be incessantly dissolved and carried off by water and the carbonic acid of the atmosphere so as to leave no soil on the rock. There are, however, in limestone various foreign matters, sometimes in such quantity as to constitute a considerable proportion of the rock; these being for the most part insoluble in water, remain behind and constitute the soil. The limestone rocks, with their impurities, usually contain the same substances required by plants that are found in the slates as above stated. Phosphoric acid is often found in larger proportion than in the slates.

3. Hornblend and other trap rocks, which furnish the soil with abundant supplies of the silicates of lime, iron, magnesia, potash and soda, besides phosphoric acid and frequently chlorine.

4. Epidote, which contains from 12 to 16 per cent. of lime, combined with silica.

5. Chlorite, which is variable in composition, but usually contain potash and always iron.

6. Hard, white sandstone.

7. Red sandstone. [Both these sandstones are almost wholly composed of grains of quartz and furnish little of use to plants].

8. Red shales, some of which contain notable proportions of carbonate of lime, in addition to the constituents before named in the slates, (1).

It is much to be regretted that the geographical distribution of these rocks cannot be accurately given, for want of a complete geological map. We must, therefore, content ourselves for the present with a brief notice of their extent and positions.

Eastward of the Monocacy, the prevailing rocks are the slates (No. 1), some of whose layers are more or less calcareous. There are also numerous isolated localities of limestone, some of which are extensive. They add much to the fertility of that fine portion of the county.

A wide belt of limestone stretches from the Potomac on the western side of the Monocacy for more than 20 miles N.N.W. Between Israel's creek and Woodboro, it underlies a fine region on the east side of the Monocacy.

North of this limestone the valley is mainly covered with redshales, more or less calcareous. A portion of it, however, is occupied with a fine-grained red sandstone, and near the northern boundary line we have the Potomac marble or brexlia. These shales also form a belt succeeding the limestone on the western side of the valley to the Potomac. They again are succeeded by the Potomac marble which courses their western limits. This variety of limestone is well exposed on the turnpike to Hagerstown, on the B. & O. R. R., and on the C. & O. Canal, below the Point of Rocks.

Along the foot of the Catoclin Mountain there are heavy beds of slates much concealed by rocks and stones that have come from the mountain sides.

A variety of rocks exist in the Catoclin Mountain, but we are without the requisite knowledge to describe their relative positions.

A hard white sandstone covers portions of the summit, whilst the larger portion of the ridge consists of epidote, slates, chlorite, amygdoloid and porphyry. Serpentine or magnesian rock, occurs west of Emmitsburg, and a verde antique marble is found in its vicinity. These rocks, abounding with the elements of fertility, produce very rich land of great value when not covered with the debris from the summit sandstones. The fine region called Harbaugh's Valley owes its fertile soil to the rocks of the Catoclin Mountain.

The Hornblend and trap rocks occur in dykes and isolated masses in divers parts of the valley of the Monocacy and in the Catoclin Mountain. They add to the fertility of the soil by their decomposition.

Middletown Valley lying immediately west of the Catoclin Mountain may be truly called one of the garden spots of Maryland. Its fertile soil is derived from the slates, the epidote, amygdoloid and other rocks containing ample stores of the mineral matters required by plants. The only occurrence of limestone in this valley, we believe, is of very limited extent near the Potomac, but the rocks before named contain ample stores of silicate of lime.

The South Mountain, whose summit forms the western limits of the county, is so much covered with the debris from the heavy beds of white and gray sandstones which constitute its upper portion that it is difficult to make out its geological structure.

Opposite Harper's Ferry, where the railroad and canal are cut along its base, the rocks are mainly quartz containing tale, felspar and mica. Upon these, there seem to be heavy beds of slate again underlying the sandstone of the summit.

Having given this brief sketch of the geological structure of Frederick county, (very imperfect, for want of the facts that a detailed survey would furnish,) it remains to be stated that it is almost entirely made up of precisely such kinds of rocks that abound with those mineral substances required to form the most fertile soils.

Leaving out the sandstones, whose aggregate area is but little, we find the rocks of Frederick county of such kinds that (excepting the limestone), if we were to pulverize portions of each and expose them to air and moisture for a year or two, we should have a fertile soil.

So far we have made no reference to the organic matters so useful in vegetation. These are produced from the decayed remains of the plants and animals which lived and died on and in the soil. If, as is the case in this county, there be an ample supply of the mineral matters, in the proper state to be taken up by the plants, they will soon

take root, and when they as well as the numerous insects and other animals that feed on them, die and decay, they form the organic matters of the soil usually called "vegetable mould."

Although our knowledge of the geology of Frederick county is very imperfect, enough of it is known to enable us to indicate with sufficient certainty the causes of the superior fertility of the soils of this highly-favored part of Maryland.

It so happens that nearly all the rocks of the county are precisely those which are richest in those mineral matters required by plants. Two of these elements are, however, not in full supply—sulphur and chlorine—but they can be cheaply and readily introduced by using small quantities of gypsum and common salt.

Most of these rocks do not exist in other counties. Carroll contains a portion of the red shales and the slates. There are slates in other counties, but they differ in their chemical compositions from most of those in Frederick.

Although the aggregate of the products of the soil in Frederick seems large when we take into account the large area of improved land as given by the census returns 1850, we are forced to admit that it is far, very far, beneath what it should be. There is certainly great room for improvement in the agriculture, even of that county. It is by no means extravagant to assert that if proper systems of culture and management were adopted and energetically pursued, but few years would be required to double the aggregate amount of agricultural production in this county, to which providence has been so bountiful.

There are various minerals of great industrial value in this county, but as as they have no direct relation to the subject in hand they need not be adverted to at this time.

Topics from Abroad.

From our Correspondent in Paris, August 11.

SHEEP MANAGEMENT IN HUNGARY.—Hungary is the most important wool-growing country in Europe, and it has many points in sheep farming meriting to be studied. In the matter of shearing, the wool is washed before being clipped. In the case of lambs, the opposite is the plan. Buyers of wool are less liable to deception when thus purchasing the washed clip, and there is less waste. Economy is also effected in the transportation. Packing wool in its grease is considered to entail loss in weight and quality.

The water preferred for washing ought to be exempt from iron, which blues the wool; neither ought it to be calcareous, as that would produce an insoluble salt of lime when mixing with the soapwort plant, (*Saponaria officinalis*), having the inconvenience of remaining incrusting on the wool and difficult to be removed. Rain water suits best, or that which can be softened by neutralizing agents. The water ought to have a temperature sufficient to act on the greasy matters, but not too low to render the workmen uncomfortable, who have to remain up to their waists in the vats. In Hungary the washing is effected partly in cold and partly in warm water thus: Two canals or runs, 70 feet long and 6½ wide and deep, having their intervening space fitted up with six vats or reservoirs, each capable of accommodating four sheep. A steam engine supplies the warm water.

The sheep are run into canal No. 1, to be steeped, washed in the vats containing the heated water and the soapwort preparation, and rinsed in canal No. 2. After being well dipped, the sheep are allowed to remain, if in evening, over night, or if in day time, three hours under a shed; a second dip ensues, next half an hour's rest, and then the animals pass to the vat. In the latter

are two men, who commence by washing respectively the head, neck, back, sides, belly, and last, the legs. The sheep pass into the second canal and are played upon by jets of water.

The sheep are allowed three days to dry, being kept in a sheltered situation to avoid dust; the drying ought not to be too rapid or in other words, forced, as that makes the end of the staple brittle and hard. The soapwort plant is common to Hungary; 336 lbs. of the soapwort, previously cut into morsels, and boiled in 700 gallons of water, suffice to wash 1,400 animals; the same water washes 75 sheep, and is changed every hour and a-half. Soapwort is a very general plant in the light lands of Hungary, especially in humid districts. About 80 persons will wash 1,400 sheep in twelve hours, at a cost of 390f. per day, or about some 5 sous per head.

Women shear sheep, and are paid 2½ sous per sheep; double this rate for rams; 18 to 20 animals can be shorn in a day, of 12 hours, and any animal injured or badly clipped, is not paid for. Women again separate the yellow from the white wool; next it is classed in classes, ewe, ram, wether, etc., and packed in bales of 112 to 140 lbs., fetching about 5½ to 6 francs per lb. Bayers admit about 11 to 15 per cent of yellow, in the white clip. The breed of sheep preferred is the *negretti*, a variety of merino; it is not precocious; a mixture of Southdown blood would be advantageous.

ENSILAGE.—The National Society of Agriculture has presented M. Goffard with an *objet d'art*, for the great services he has conferred on agriculture generally, by his plan of ensilage. He has just brought out a new edition of his manual, which contains some new facts and points out errors to be avoided. The final results of his ripe experience is this, for maize, give the *silos* or trenches, an elliptical shape; build in masonry, perfectly air and water tight, free from angles and profoundly embedded in the soil; cut the maize before emptying into silo; press it energetically and continuously during the whole period of preservation. It will keep thus perfectly for seven months, turning out an agreeable, yellow, and palatable mass, having no musty, greenish borders, such as result when in imperfectly constructed trenches.

HELPING COLTS.—The addition of either pure phosphate of lime, or that salt in the form of calcined bones, has proved very beneficial in the rearing of colts, developing most happily the points of the animal. The phosphate, half an ounce, is given in the form of a mash; this over a quart of oats is poured in boiling water, then one pint of bran to absorb the latter; allow the mass to swell, and when cool, add the phosphate. Chopped hay or straw can replace the bran.

DIGESTIBILITY OF RATIONS.—M. Kuhn, of the experimental farm of Mockern, Germany, has since 1877 been occupied in a series of experiments on the comparative digestibility of rations in a natural or prepared state. The moistening of meadow hay with water, or with bran-water, effects no advantage in point of digestion. He has found, that pouring boiling water on bran, and allowing it to steep thus during 24 hours, positively retards digestion of the constituent elements of the bran. It is a matter of indifference whether the bran be given in the form of a drink or alone, or mixed with chopped hay. It would result then, that neither the steaming of food nor its preliminary fermentation, contributes to the digestibility of the rations. Opinion will differ over these conclusions. All are agreed on this point, that when food is taken into the system at a higher temperature than that of the body, digestion is interfered with.

The more nature is sad, the more the hearth stone is dear.

Neatness on the Farm.

The Deer Creek Farmers' Club met on Saturday at "Dunleith," the residence of Mr. Thos. A. Hays, near Churchville.

The club in a body accompanied the committee, Messrs. Archer, B. Silver, Jr., and Munnikhuyzen, over the premises and through the buildings. Mr. Hays' residence is a large, old-fashioned stone house, built by his great-grand-father, Archer Hays, in 1808, as appears by a tablet in the front wall, which bears the date and the initials "A. & H."—Archer and Hannah Hays, his wife. A bed of coleus in the lawn, containing a great many distinct varieties, many of them rare and beautiful, attracted attention. Mr. Hays was experimenting in the use of nitroglycerine for the removal of stumps. Two blasts were discharged in the presence of the club, but were not successful in throwing the stumps out.

The committee reported, through Mr. Archer, who said that since Mr. Hays was opposed to whitewashing reports he would inquire why his plowman skipped so many places. Mr. Hays said this was only on one part of the field, and was the fault of the colored plowman.

Mr. Archer did not think any farm in this section has been improved as much as Mr. Hays' since he has had the management of it, whether the improvements have been economically made or not is debatable. His buildings are in good shape and there are plenty of them; his stock cattle, hogs and young cattle—thorough bred and grade Short Horns—look well. His horse stable is the best he ever saw. The shed in front is a good thing. He deserves credit for the manner in which he has kept his place up. He has a beautiful osage orange hedge which he is now engaged in trimming.

In reply to the question when such hedges should be trimmed Mr. Hays said they could be trimmed any time in the year. The oftener the better.

Mr. Silver thought it a good plan to have the horse stable separate from the barn. Considerable risk from fire is avoided thereby when wagoners come home with their teams late at night and use lanterns.

Mr. Munnikhuyzen said Mr. Hays kept his implements well housed, and he thought it less expensive to keep up a roof than to replace farming implements every few years. Mr. Webster thought the appearance of Mr. Hays' farm would greatly overbalance any little criticisms the club could make. Mr. George E. Silver said Mr. Hays' garden should have been noticed. There is not a weed in it; and Mr. Moores spoke of Mr. Hays' fine Berkshire hogs.

Mr. Webster deprecated the custom of farmers throwing weeds into the public roads. The seeds are washed into the streams and scattered through the fields. Mr. Munnikhuyzen said wagon wheels also pick up weed seeds with the mud of the road and carry them great distances.

The subject for discussion was: "Does neatness on the farm and its surroundings pay the farmer?" We are indebted to the *Argis* for our report.

Mr. Hays said it always does. In every rural neighborhood the most prosperous farmers are those who keep their places neat, buildings painted or washed, fences and roads in good repair, and their fields free from weeds and rubbish. It may be said that men with plenty of money can afford to spend it for show, but this is not the full explanation of this coincidence of facts. Men who make money in farming are least inclined to pay it out merely for show, and it may be safely put down that all work done by the thrifty farmer is in the direction of profit. Hence as neatness commonly goes with thrift, it is quite as likely one of its causes as one of its effects. Habits of neatness are not too common, and in every

business the men who do their work in the neatest and most thorough manner get the best pay. The farmer who grows his crops among weeds can never sell his grain at the highest market price, while the little extra care required to grow and keep crops clean always pays well. A man who grows pure seed of any kind will find a demand for his entire crop at prices enough higher than the market rates to make a good profit for his care. Growing seeds and garden vegetables is nearly always remunerative, because they cannot be successfully grown without close attention to details and neatness. It pays a farmer to have an eye to his line fences, his own and neighboring roads, keeping them well drained, smooth and free of stones. Let us have good roads, neat farms, and we will have good neighbors and a prosperous, thrifty section.

D. E. Wilson had no doubt it paid if not carried to an extreme. Fancy ideas of neatness may not pay, but everything ought to be kept in as neat order as practicable. Weeds ought to be destroyed and farmers should use only the best seed, raising it themselves.

R. Harris Archer said a certain degree of neatness should be observed. In fences the most economical should be put up, regardless of appearance. If a man has plenty of chestnut the worm fence is the cheapest but does not look as well as others. In some sections hedges are the neatest, but he would not advise their use where rails are plentiful. He thought there was a great deal of time wasted in the effort to get rows of wheat shocked perfectly straight. The same in cutting up corn. Mr. Hays' gates are neat, but he thought there was no necessity for more than one large post, to which the gate is swung; the other could be light, and expense saved thereby. He concluded, however, that there was more likelihood of neatness being underdone than overdone.

Benj. Silver, Jr., thought neatness desirable in everything, but did not think it paid to carry it too far. It seemed to be every man's aim to make money, and the man who spends his money in making his farm neat and attractive deserves as much credit as one who succeeds in accumulating money by his labor. A post and rail fence may be out of shape and a new one would look better, but if a stake here and there would make it last longer and answer the purpose it would not pay to put a new one. Keep bushes down and make your place look as neatly as you can. Neatness is not overdone generally, and as a rule it pays.

Geo. E. Silver was of the opinion it paid the farmer to be neat, to keep his fence rows clean, and briars and bushes cut down. Even a worm fence may be put up neatly. Neatness around the dwelling is also desirable. It makes home attractive, excites self-respect, energy and ambition. Harford county is rapidly improving in respect of neatness. Fences are put up in better style, fence rows kept cleaner, houses are white-washed or painted—all adding to the general improvement of the county. If a man has money to spend it might pay him to be what might be termed "over neat."

Wm. Munnikhuyzen said it decidedly pays to be neat, not only in our surroundings but in putting in and gathering crops. Slovenly work denotes bad farming. Neatness may be carried to an extreme, but it is seldom done. He had traveled through other States and had seen no section that can compare in neatness to Harford.

R. John Rogers was in favor of neatness, and like others of preaching what he did not practice. Wherever you find a man particularly neat and careful in farming you are likely to find him neat and careful about everything. A man can educate himself in habits of neatness. When fence rows are cleaned the refuse should be hauled away and deposited in some wash or other place.

It pays to have neat substantial gates instead of bars. No reasonable amount of labor should be spared in putting in crops. It was supposed that oats require little care in planting. He had found it paid to prepare the ground thoroughly, harrow it well and drill them in. Anything spent about our homes to make them neater, more desirable and comfortable is money well invested.

Jas. Lee said that in selecting a tenant he would take one he knew to be neat in farming. His practice is to begin to cut down bushes the day after the last load of hay is hauled in. He remembered when it took several weeks to cut down bushes on his farm, now it can be done in a few days.

John Moores said he liked to see neatness, but there is a happy medium to be observed. Neat farming is sometimes too costly. It should be regulated by the ability of the farmer. Some farmers who are the reverse of neat in their work make more money than their neater neighbors, but the neatness would probably tell in their favor in the sale of their property. Some work never pays except to please the eye, but you can't do good farming without doing it neatly and well. It pays to plant trees and paint buildings, but it does not pay to take down a good fence and put up a fancy one. The destruction of weeds and bushes, keeping fences and ditches in good order pays.

Wm. Webster said it was an old adage that cleanliness is next to godliness, and neatness being akin to cleanliness, logically speaking it certainly pays. Corn rows, for instance, cannot be too neatly put up. In putting in wheat a careless driver may run against a shock, pull some out, thus leaving a place for rain to get in and spoil the corn. Every neat farmer is an advantage to his neighborhood, as neatness is catching. A stone or a worm fence may be kept up neatly. Circumstances must govern the degree of neatness a farmer can observe. If he has a large income he might go to some expense for show.

D. C. Timanus said that anything worth doing at all is worth doing well. Well kept farms are a great attraction to a neighborhood, and pay, too. Things kept neatly and in order last as long again.

N. N. Nock said there was economy in neatness. You can get better and quicker work out of implements and machinery kept neatly. If stock is kept thrifty and comfortable you can get more service and quicker service out of it than you can from neglected and ill-cared for stock. The surroundings of the home should also be made neat and attractive. It is a great advantage to a neighborhood to have thrifty, well-kept places. You would have to carry neatness to a great extent to make it unprofitable.

Geo. R. Cairnes said neat farming is attractive to strangers, who are more likely to buy land where farms are neatly kept, and thus neat farms are likely to bring among us a class of people who would be of advantage to the county. Neatness in farming pays, but it should not be carried to too great an extent.

The President, S. B. Silver, said to make money a certain degree of neatness is required, and a farmer should show this in all his transactions.

Mr. Webster said he did not agree with the idea advanced that it should be the aim of the farmer's life to make money. It should be the aim of every man to make the world better by having lived in it. If he can make it better by making and spending money, then he would agree with the proposition.

Adjourned to meet at "Highlands," the residence of Mr. John Moores, September 15th. Subject: "Roads," Committee of inspection, Messrs. Webster, Rogers and Hays

Different Breeds for the Dairy.

The Toronto *Globe* gives the following as the conclusions from experiments at the Ontario Model Farm as deduced from Prof. Brown's last report:

An average cow for dairy purposes should give twenty pounds of milk per day during 200 days every year; eight pounds of cream for every 100 pounds of milk, forty-five pounds of butter from every 100 pounds of cream, and fully ten pounds of cheese for every 100 pounds of milk. Bulk, volume, or per cent. of cream, is no safe criterion of the quantity of butter in that cream; weight alone is the proper mode of judging. Breed, as much if not more than food, affects the quantity and quality of milk, cream, butter and cheese. In Ontario experimental-farm experience, the Shorthorn is an average milker, short in duration per season, low in specific gravity, high in butter, and also high in cheese production. The grade of this breed approaches the nearest of any others to what is called a "general purpose cow." The Aberdeen Poll is low in quantity of milk, and the second highest of any in specific gravity. The grade in this breed is much improved in milk properties, giving a greater weight of cream, though a lower per cent. of it. The Hereford is not more prominent than the Shorthorn and Aberdeen Poll in regard to milk, except in proportion to butter from cream, in which it is highest. The grade is very prominently in advance, particularly in proportion of cream, but one of the lowest in cheese. The Devon is most distinct in highest specific, and the weight of cheese from milk. We have no experience with the grade of this breed.

The Galloway milk appears to be of a peculiar texture—rich, or so very small in butter globules as to rise very slowly and very indistinct in the test tube.

The Ayrshire is a particularly heavy, long milker, giving five times her own weight per season. The milk is somewhat low in gravity and per cent. of cream, but it is over the average in cheese production. The Ayrshire grade is not improved in any respect except in duration of milking season.

The Jersey is remarkable for proportion of cream, averaging thirty-five per cent., and giving a value of dairy products incomparable to any other breed in our experience. The native, or common cow of Ontario, not Canada properly, because Quebec in particular stands distinct in her class of dairy cows, takes a high place in value of annual produce for ordinary dairy purposes, and along with the Shorthorn grade is peculiarly the dairy cow of the country.

Horticulture.

The Orchard and Fruit Garden.

Frequently the advice has been given to fruit growers, through horticultural and agricultural mediums, to not cultivate their orchards *too late* in the season, as such late tillage would tend to prolong the growing period of the trees to an extent endangering the proper and thorough ripening of the growth, upon which the following year's crop of fruit is dependent; and in case of a severe winter following, the fruit buds in orchards so cultivated, are quite likely to be frozen, etc., etc. This advice for more northern latitudes, and where severe freezing weather begins earlier than here, may be all right; but for Maryland and southward, there is not one particle of practical common sense in it. To the "fine-thread" "theorizer," it may present itself in the light of an important consideration, but in real practice it is found to be an impossibility to keep a bearing orchard growing to such time in the fall, as to prevent thorough ripening of the wood; the trouble is to keep them growing long enough. Taking the subject as a whole, it is not *too much* culture that does mischief in

our orchards, but just the opposite; if there were three times as much cultivating and manuring done, as is the present practice, and has been since our earliest recollection, we would be able to supply our markets with fruit of infinitely superior quality than we now do. A very plain illustration of the truth of this assertion came under our notice this season. A gentleman having two peach orchards, one on land carefully and thoroughly cultivated, and in such a state of fertility as would insure a good crop of corn, the other on poorer land, and not so well tilled; the difference in the same varieties grown in these orchards was surprising—and in the same market, the difference in prices obtained was no less so. Hence, such of our readers who contemplate planting orchards in the future, we would with much earnestness urge to *carefully* consider the after care and management of their trees, before deciding upon the number to plant; and if not *certain* that one thousand trees (ten acres, if peach) can be properly cared for, both as regards culture and manure, cut down the quantity until that point will be reached to a certainty.

In Peach-growing districts, nearly every farmer has an orchard ranging in size from two or three hundred trees to five thousand. The proper management of even ten acres of orchard in connection with the labor incident to farming is a matter of no small moment, and demands a business capacity, such as is not possessed by more than one man in four of those engaged in farming. As a rule, either the business of the farm or that of orchard management, is bound to suffer more or less every year, and unfortunately it is too often the case that *both* suffer. First, the growing scarcity and utter worthlessness of labor, is to be considered; next, it must be remembered that the plowing and cultivating of these ten acres of trees, will to some extent interfere with the tillage of farm crops; and then when once in bearing—when the farmer has his fallow to prepare, his fodder to take down, and a dozen other things pressing upon his time—*then* is the time when there is vexation of mind and weariness of body; there can be no halting at this juncture; metaphorically, "the iron is hot," and *strike* is the only alternative. We agree with the views of a Hibernian friend who holds that "It is better to have too much of a good thing than not enough;" but a big crop of peaches to handle in a short period, and that too at a busy time on the farm, requires a good administrative cast of mind, with plenty of physical "grit" thrown in, to make it an endurable success. It is not only important that the planting of a *Peach* orchard receive this kind of study before ordering the trees, but it is equally important with other fruits—apples, pears, or whatever kind it is the object to grow; no less so in strawberries, raspberries, blackberries, etc. In fact, proper decision here, is paramount in importance to that of procuring the right varieties, for this reason, that it matters not, though your varieties may be the very "cream," yet with improper culture, or rather no culture upon half starved soil, the result is more vexing than if you had planted inferior kinds; in either case, though, you are out of pocket.

We refer to this subject at this time, more particularly for the reason that every planting season enlists new recruits into the army of fruit growers, and the "raw recruits,"—those lacking experience—are the ones most likely to be led into "over planting," by the flattering results obtained by calculations based upon the product of a single tree, or a *small* orchard, well cared for. It is very easy, after knowing that half-a-dozen crates were produced by a single tree, that netted two dollars per crate, to multiply the twelve dollars thus obtained by one thousand, and by figures—those identical little characters that have the enviable reputation of carrying with them a veracity as pure as that of the

dear little boy that hacked his father's favorite cherry tree with the "little hatchet"—yes, by actual figuring—on paper—one thousand trees will net the grower twelve thousand dollars. This is a very simple theory, yet, simple as it is, it has a fascination for the inexperienced planter, which only matures into sad disappointment. True, the average life of man is not very long at best, and in order to accomplish anything worthy of remembrance *by his friends*, he is compelled to run his business with all possible speed; yet it must not be forgotten, that *too much haste* may permanently destroy the brightest hopes, reacting like a withering blight upon energy and enterprise.

Kitchen Garden—September.

In the early part of the month turnips may be sown and those already up should be timely thinned. Kale and spinach may be sown and onion sets planted at any time when the ground is in good condition. For the last two articles the ground can hardly be too rich, and it is not wise to trust to artificial manures alone. Rows may be 15 inches apart. Did time permit I would prefer to sow spinach by hand. There are always blanks in the rows when the machine is used. Cabbage and cauliflower are usually sown in well prepared soil from the 20th to the 25th and it will not be safe to vary much from these dates. There is so much vacant ground at this season that it is well to keep up the habit of sowing rye to cut green in spring, to make mats or to use as a mulch about trees or small fruits. Celery requires to be kept well hoed and cultivated. Artificial watering appears almost indispensable for celery at times, but such laborious work soon takes away the profit of the crop.

Flat Culture.—Up to the present season I had never known potatoes to be raised without a certain amount of earthing up; and had time permitted no doubt I would have followed the old habit. The crop is unusually good here as elsewhere and all the better I believe for the want of the bank of earth. Here and there a green end may be seen a half inch or so above ground showing that a single inch of earth drawn up would probably be just the thing. The rows are 2½ feet apart for early rose, which I find to be the best distance.

Good-bye Potato Bugs.—Last year I mixed the usual quantity of Paris Green and plaster required annually for my potato patch, but found that I had sufficient left over to do for this year, and now again, I believe, enough for next year, showing that we have got them pretty well under control. I pay no attention to them in the early part of the season, but dust the vines when the young brood comes along. I have an idea that from the Paris Green and plaster having been mixed the year previous the compost is stronger than if mixed just before using. It was surprising to see how slight a dusting did the work.

Towards the end of the month is a good time to lift and *heel in* strawberry runners for spring planting. For raspberries and blackberries all should try the close pruning so strongly practiced and recommended by Mr. Purdy, whereby the great labor of staking and tying is avoided. Those, however, who have only small gardens had better plant more closely and keep the vines tied up in the old way.

Ordering Plants by Telephone.—This is bound to be a convenient arrangement if one is only sure of his man at the other end of the line, but my first trial was anything but satisfactory. A few thousands of cabbage plants came along, so spindling in their growth that when heeled in an inch apart but few of them touched each other. Stunted old things they are; I doubt if I shall ever plant them; would gladly return them for a trifle of what they cost.

Nurserymen and seedsmen, while not neglecting the telephone, are showing, in another way, a still greater spirit of enterprise. It may not be generally known that many of the former avail themselves of the use of stenographers to help them through with their immense correspondence, and now we have Peter Henderson dropping his autograph letters and handsome signature and simply hinting his thoughts to one who is ever on the alert to receive, print and transmit them. The telephone is tangible and very generally appreciated; the more subtle medium of a stenographer and his ways in the matter of expediting business is not so readily understood by the average business man.

The flowers.—These will soon be gone and, as a rule, the best way is to let them go. In the kitchen garden hardy plants should predominate, and things that are readily killed by frost are hardly worth saving unless one has a greenhouse. Some things, however, that are almost hardy may be kept over in a frame, and geraniums, if well cut back and kept rather dry will keep in house or cellar. Transplant violets to a frame of rich earth, and make a bed of parsley in the same way. Flower seeds will be ripening and will often be worth saving. Rose cuttings generally root readily at this time in sand in a cold frame; if they root well they may stay there with the protection of the sash until spring.

There will now be some time for ditching, draining and other necessary improvements. A drain-tile is one of the rarest sights in these parts. What do these people drain with, or do they drain at all?

JOHN WATSON.

To the Bee Keepers of Baltimore County and Vicinity.

The date fixed for the Annual Fair of the Baltimore County Agricultural Society at Timonium is fast approaching, and as Superintendent of the Apiary it becomes my duty to urge upon you the importance of contributing to its success. The society have doubled their premium list, over last season, and now amount to more than all the other Agricultural Societies of the State combined.

Ample provision will be made for an extensive exhibit of everything pertaining to this class, and I earnestly hope to see the space well filled up.

There are many good reasons for urging every bee keeper to *turn out* and make strenuous efforts to have this department the attractive feature of the fair.

Honey has become a staple product and it should be our aim to produce it in the most attractive and marketable shape, and there is no better place to "compare notes" than at the fairs.

To this end we should endeavor to popularize the consumption of honey by all classes, as well as to raise the standard of production by applying correct principles, and progressive art, to the management of our chosen pursuit.

Bees and honey are already "the great centre of attraction" at our fairs, and have given prominence to the industry, and thus becomes more apparent each successive year.

Let each bee keeper then contribute his or her best specimens. If you can't send bees, send honey, a bouquet of honey producing flowers, in fact anything to make a full exhibit. To the lady bee keepers of the State, this will afford an excellent opportunity to enter "the lists" with the sterner sex, and prove at least in this case that women can accomplish as much in this branch of industry as their brethren.

A meeting of the Bee Keepers of Maryland and vicinity and all interested, is called to assemble at the bee tent, at 11 o'clock A. M., Thursday, September 6th, for the purpose of forming a Bee Keeper's Association, by several prominent bee keepers of the State. Come one and all, and let the bee keepers exhibit at Timonium 1883, be "the fair of the season."

C. H. LAKE.

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- 189. Colony of Italian bees with movable combs. ...\$4.00 2d, 2.00
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- 192. Crate of honey ready for shipping..... 4.00 2d, 2.00
- 193. Best display of bees in movable combs including their public manipulation, premium.....\$10.00

The American Farmer

"O FORTUNATOS NIMIUM SUA SI BONA NORINT
"AGRICOLAS." Virg.

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At the office of THE AMERICAN FARMER
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Maryland Horticultural Society.
Maryland Dairymen's Association.
Maryland State Grange, P. of H.
Agricultural Society of Baltimore Co.
Also, of the Maryland Poultry Club,
Thos. W. Hooper, Secretary.

BALTIMORE, SEPTEMBER 1, 1883.

THE address of Dr. Ellzey before the
Woodlawn Agricultural Society, and for-
warded for publication in THE AMERICAN
FARMER, contains a fund of valuable infor-
mation upon the subject of Fertilizers, which
every farmer should understand as neces-
sary to his success in the honored and re-
sponsible vocation in which he is engaged.
Some of his views, however, as to the value
of certain fertilizers now in almost universal
use in the Middle and Southern States will
probably not pass without lively criticism.
The subject indeed is one open to a wide dis-
cussion, and may lead to such an one as that
of many years ago in these pages between
Col. Capron, of Prince George's, and Carey,
of Baltimore county, as to the best means of
resuscitating depleted soils, or that, on an-
other branch of the same subject, between
Hon. Charles B. Calvert and Edward P. Ro-
berts, Esq., the principal associate editor of
the FARMER. These discussions were sup-
plemented by the Prize Essays of Edward
Stabler and others on the Improvement of
Worn-out Lands, and no doubt led to the
great advancement in the agriculture of this
and other States which has been witnessed
since their publication.

COMBINATION SALE AT WASHINGTON CO.
FAIR.—It will be seen by the advertisement
elsewhere that at the Fair in Hagerstown,
October 16 to 19, there will be a general sale
of imported stock, implements, machinery,
etc., contributed by many exhibitors. The
county is a rich and prosperous one, and
among its pushing farmers many purchasers
ought to be found. The plan of the sale is a
good one and deserves success.

THE BALTIMORE COUNTY FAIR.—As we
go to press all the indications point to a
large and successful Fair at Timonium. The
stock exhibits will be numerous and good,
Jerseys predominating as usual, and in every
other department a varied and full display
is expected.

AGRICULTURE IN THE SOUTH.

Progress in Agriculture—Is there any Room
for Further Improvement?

By TH. POLLARD,

Ex-Commissioner of Agriculture of Virginia.

In our last, we were speaking of what the
United States Government had been doing
in modern times to promote the progress of
agriculture. Prof. Riley instances the fact
that the Government last year, or the year
before printed 300,000 copies of the An-
nual Report of the Commissioner of Agri-
culture, as an evidence of liberality in behalf
the great farming interest of the country.
It is estimated that one-seventh of the popu-
lation of the United States is employed in
agriculture, which would amount to seven
millions. But taking another estimate,
which would be fairer in reference to the
needs of farmers for the reports. The last
census (1880) shows there are 4,008,907 farms
in the United States. Now we should think
that each head of a farm should have one
of these reports if they are valuable, and we
think they contain much matter that is
valuable, while they contain much that will
not interest the ordinary farmer, but as it is,
the 300,000 reports cannot reach as much as
1/10 of the farmers. Admitting that one half
the heads of these more than four millions,
are not reading men, we shall have more
than two millions left who should be sup-
plied with these reports, and it is probable
that much more than one half, as supposed,
would read the reports or portions of them,
if put in their hands. This shows how
inadequate is the support given by our
government to the great interest of this
great country, an interest, on which all
other interests of the people depend. In
1878, our government appropriated to the
Department of State more than a million
dollars, to the Treasury Department, more
than twelve millions, to the Department of
Interior three and a half millions, to Post
Office Department nearly five millions, and
to the War and Navy Department (includ-
ing military and naval establishments) more
than fifty millions, while to the Agricultural
Department the appropriation was \$208,-
640. We do not argue that the appropria-
tions to the first named departments are too
large, but we doubt not they might be
smaller, and accomplish the same purpose,
if economy and honest management were
enforced, but we do say emphatically that
the appropriation to the Agricultural Depart-
ment is too small. Some two or three years
since General Le Duc, then Commissioner
of Agriculture, requested of Congress an
appropriation to enlarge his Chemical De-
partment and employ chemists enough to
analyze all the fertilizers the farmers might
desire, and to purchase an experimental
farm near Washington. He told the Con-
gress that the room for chemical work was
in the basement of the agricultural building,
was badly ventilated, was cramped, and
every way unfitted for his purposes, and
urged the farm as a place where numerous
experiments might be conducted, and un-
settled agricultural problems might be solved.
But no attention was paid to his suggestions.

The different States are doing something
of importance towards the progress of agri-
culture. Some at the North, and some in
the West have their Agricultural Depart-
ments and State Boards of Agriculture, and
seem to be working efficiently, but our re-
marks are particularly about "Agriculture
in the South." Virginia has a Department

of Agriculture, under control of a Commis-
sioner of Agriculture, but with an insufficient
appropriation, only \$5,000, (from which
comes the salary of the Commissioner and his
clerk). A respectable cabinet of minerals
and productions of the State have been col-
lected, and yearly reports have been issued,
except, we think, for 1883, as also a "hand-
book of Virginia," with a recent map of
the State. (The writer was Commissioner
of Agriculture from July, 1877 to January,
1882). This department was established
in July 1877. Georgia has a department of
agriculture established some ten or twelve
years since. The first reports from Dr.
Janes, Commissioner, were very creditable.
Some three or four years since he was super-
seded by Col. Henderson, from whom we
have seen no reports. In this State and
Virginia, these departments have been sub-
jected to political influences, and their heads
are the appointees by the dominant party.
South Carolina has a Department of Agri-
culture, Col. Butler, the Commissioner, and
seems to be doing a fair work. Alabama
has an Agricultural School at Auburn. Their
reports, if any have been published, have
not come under the writer's notice. North
Carolina has a Department of Agriculture,
Mr. McGehee, the Commissioner, and Dr. C.
E. Dabney, of Virginia, the chemist, and we
think it is conducted with much success and
ability, particularly on Dr. Dabney's part,
who has issued the only reports from the
institution, we have seen, and they are able
and instructive. North Carolina is the only
Southern State which has taken steps to be
represented at the coming Boston Expon-
sition this fall, in behalf of agriculture, arts,
mineral productions, etc., and it is said that
this State will have there a superior collec-
tion, especially of its minerals, in which it
abounds.

Among the most prominent improvements
in modern agriculture has been the inven-
tion of labor saving machinery. The writer
can remember when there was almost no
farm machinery—nothing but the wheat fan
and plows. Wheat was gotten out by
horses' hoofs, flails and a lumbering old roller
made by putting blunt pins through a large
log, which was drawn around by horses.
Many farmers were slow to avail themselves
of farm machinery, and the English farmers,
as intelligent as they are, as late as 1851
were still using the hand "reaping hook" to
cut their wheat, as we witnessed in their
harvest of that year. In that year McCor-
mick's reaper was introduced into the
country, being exhibited at the first "World's
Fair" in London, and was tested on some of
the wheat fields in the vicinity. The pro-
gress of improvement in agricultural ma-
chinery has been very decided in the last
few years, and the improvement continues.
To Americans is due most of the credit of
these inventions. There is decided room for
improvements in making this machinery
out of better materials and of more dur-
ability. Farmers lose a great deal in time
and money by the breakings which so often
occur in machinery, part, no doubt, the
result of bad management, but very fre-
quently because of the want of the best
materials, the best metal and the best wood
and of the best workmanship. Defects are
easily covered by paint, and the farmer
should endeavor to buy only from workmen
of known skill and honesty. The charge for
machinery is ample to secure all the requisites
of first-class implements. Farmers should
endeavor to understand thoroughly the
construction and working of every machine
he uses, and should not entrust it in the field
to any hand who does not well understand
its management. As an aid to the proper
comprehension of this subject it will be well
for every farmer to provide himself with a
copy of "Thomas' Farm Implements and
Machinery" (price \$1.50), or some other good
work on this subject.

I have recently read a work on "Land
and Labor in the United States," by Mr.
Moody of Boston, in which he comments on
the machinery employed in agriculture, and
particularly on the great "Bananza" farms
of the Northwest. The results of labor
saving as compared with hand work is won-
derful. He further illustrates by an account
of the machinery employed in textile fabrics,
where labor saving as compared with the
old mode with the wheel, and cards, and
hand loom, is immense. The farms alluded
to are, many of them, so large that notwith-
standing the extensive use of machinery
of all sorts, as many as 250 or more hands
are employed on them during harvests, and
then in the winter months only five or 10
men are employed to take care of the ma-
chinery, and the moderate amount of stock
maintained on these farms. Mr. Moody
contends that the machinery thus employed
is working great harm to the laboring classes
and small farmers, and that great poverty in
these regions is the result. He says that the
tenant farmers cannot compete with the
Bananza farmers, with their large, expensive
farm machinery. He cites a farm where
55,000 acres were in wheat, the nett profit
being \$7 per acre. This would amount to a
very large sum, while this profit to a moder-
ate tenant or small farmer would rarely sup-
port his family, and besides, he could not
realize this profit without machinery, which
he cannot afford to buy. But we doubt Mr.
Moody's conclusions. Without these large
farms, the laboring classes might probably
not get employment at all, and without
machinery these farms would not have been
established. If these large farmers by use
of machinery make profits, it is no evidence
that the tenant and small farmers would
make larger profits, if there was no ma-
chinery in use. We can well remember
when wheat in Virginia, before the use of
machinery, sold year after year for 90 cents
and \$1 per bushel, and recently I crossed a
bill of my father's for groceries in 1838, which
showed the ruling price of these articles was
nearly the same as now, except for sugar,
tea and coffee, which were higher. This
shows the small and tenant farmers, were no
better off then than now.

The fact that the price of horses and mules
has increased since the introduction of rail-
roads is a puzzler to those who think the
use of machinery will bring down the price
of farm products and injure farmers. We
well remember when it was said that
steam engines on railroads would break up
the raising and profitable sale of horses. In
place of this, their price has increased, and
we never knew them higher than they were
last spring; this being the consequence of
the increased business of the country
brought about by railroads stimulating pro-
duction, and creating demand for horses to dis-
tribute it at their terminal points, passengers
too, as well as products, and besides this,
horses are in increased demand to carry
these increased products to the railroads. It
has become manifest that Europe cannot
feed its population, and large production in
this country will hurt no one, either large or
small farmers.

THE trustees of Purdue University, La-
Fayette, Ind., have abolished the Greek and
Latin departments from the institution.
This gives agriculture and horticulture, and
the sciences related thereto, a broad swing.
The Hon. W. H. Ragan will superintend the
experimental department of the college
farm. He is best known as a horticulturist,
being at present the efficient secretary of
the Mississippi Valley Horticultural Society.
Now that Purdue University is well rid of
the dead weights of Latin and Greek the
public will look for efficient work there in
fitting the youth of Indiana for the active
duties of life on the farm.—*Prairie Farmer.*

Home Department.

Moths.

We all know of the damage these seemingly insignificant pests are capable of doing, and exercise ourselves wisely and rigorously to protect our household goods from their depredations. Why is it, I wonder, that we are less careful about the moth-like habits which attack ourselves with far more damaging effect than our most valuable possessions are subject to from real moths?

The one of which I am about to utter some palpable truths is singularly free from observation of any kind. We rarely hear it spoken of, and never is it practiced openly, even I believe among the most degraded—and yet the vendors of the vile stuff, and the physicians also assure me that the practice is more common than the use of intoxicating liquors, and is supposed to be more injurious to the intellectual faculties, and equally so to general health.

This habit to which I refer is that of "snuff rubbing." I would not venture upon a subject so generally avoided and so unpleasant even to speak of, were it not for the rising generation. Among those who practice it there seems to be a lack of conception of the evil thereof, and they rarely take any pains to prevent children from acquiring a taste for it. The injurious effects are slower in manifesting themselves and never so completely overcome the senses as opium and alcohol, but they demoralize the individual quite as surely, unfitting its subjects for intelligent thought or action, and compel them to go through life shamefacedly, with a constant sense of having something to hide. It is also a constant drain upon the purse, and in a great majority of cases runs away with a large percentage of somebody's hard earnings.

All this is equally true, of course, of the ordinary use of tobacco, as far as the cost of it goes, but custom among the better class of people renders the open use of it to some extent respectable, while with "snuff rubbing" the habit creates alyness, and so degrades the man or woman at the start, and then renders them so stupid as to hamper their usefulness, and unfits them for the satisfaction of ordinary intercourse, to say nothing of the impositions they are consequently subjected to.

What I am desirous of doing is to awaken, if possible, the mothers who are addicted to this practice to a sense of the condition of slavery into which they are fallen, and persuade them therefore to keep their children from a like bondage. I might exhaust the whole field of argument which abler pens than mine have used to condemn the use of tobacco and alcoholic drinks, and they would apply equally to this abominable habit, but space nor the occasion neither of them admit of it: besides, it is an old, old story, and we all know it by heart. This other habit, however, is so much overlooked, and comparatively no effort made to arrest it, that I venture in this modest corner to raise my feeble voice, hoping it may impress some one sufficiently who may have the ability and power to take some steps toward protecting the young from the baneful example so common among their elders. I do wish I were better prepared to show just how the vile practice affects the system; I trust, however, some one who does know all about it will raise a voice of warning in time to save the coming generation.

Why do we so weakly permit moths of various kinds to prey upon our highest and best faculties? They come upon us in forms we can easily recognize and escape from if we are so minded; sloth, depraved appetites of various kinds, selfishness, profligacy, looseness of tongue or temper, are all, like moths to the garment, eating into and unfitting us for the uses for which our Creator designed us, and which it would be our highest good to accomplish.

CERES.

A Cheap Filter.

Very many families desire some inexpensive device for filtering rain and other waters to be used for cooking and table use. A cheap and very efficient filter may be made by using a spirit or wine cask, placing it on end, with the head removed, and having a faucet at the bottom to draw off the clear water. To fit it for a filter, take the removed top head of the cask, and with a small bit bore holes all over it, then place four clean bricks or blocks of wood on the bottom, and on these rest the perforated top. Now fill upon it about four inches of charcoal chopped into small bits the size of peas, and over this place a layer of clean sand, six inches deep. Impure water poured into the cask on top of the sand, will become clear and sparkling after a little while, or as soon as all fine particles are worked out of the charcoal and sand. This filter will not need renewing oftener than once in two or three months.—*Popular Science Monthly.*

BAD HABITS are small at the beginning, but they grow to enormous size. It is as difficult to destroy them when fully grown, as it is easy to kill them when "in the egg." A little giving way to a bad temper may end in murder. Little fits of idleness may lead to dissolute habits. How big these little sins may grow we dare not even think. The best way then is to take hold of them, put a check on them while they are young, ask God to give us His grace to overcome them, before the take possession of us, and destroy us. The longer we put off trying to check these evils in our hearts, the harder shall we find it to be. So let us go to work at once, and try to overcome them while they are small, not wait until they are fully grown, when we shall more than likely be overcome by them.

SOIL FOR POTS.—Most soil needs a liberal admixture of peat or well pulverized muck before it is in a condition for using in pots. The bottom of the pots also needs a layer of finely-broken brick, over which should be placed a little sphagnum. Peat and sphagnum are not always easily procurable, and in such cases a good plan is to dig up clumps of fern-roots from any brake bog by means of an old axe, and then to chop them up with a spade or axe. When well cut up the roots may be pulled out and shaken, and then used as a substitute for sphagnum. The fine, muck-like earth which retains will be nearly equal to florists' peat for the cultivation of most common plants.

A Large Yield of Wheat in Dorchester.

Danville, September, 1883.
Messrs. Davison & Co.
Gentlemen: When I was up to purchase my fertilizers you asked me to give you an estimate of how I prepared my land last year for wheat that I raised 50 bushels per acre. I flushed up 10 acres of stubble that I had raised 38 bushels per acre the year before with your fertilizer. The land is a yellow clay soil, after flushing I rolled and used cultivators on it, then sowed 200 pounds per acre of your "High Grade" Superphosphate broadcast, then drilled 1½ bushels wheat per acre, it is a new variety I got from the Patent Office three years ago, smooth head, red, long berry, as forward as the Fulse, and stands the winter better than any I have ever seeded. I grew 500 bushels on 10 acres. I think your fertilizer is the very thing for farmers in this section, the clover the largest I ever had.

Yours, &c.,

L. P. SKINNER.

Danville, Dorchester Co., Md.

STILL POND, KENT CO., MD.,
August 4, 1882.

Messrs. J. E. Tygart & Co., Smyrna, Del.
Gents: I have been using on my farms and selling your Star Bone Phosphate for the past six years by the side of Turner's and all the leading brands—manufactured in Philadelphia and Baltimore, and must say that I have never used or sold a fertilizer that has given on all soils such universal satisfaction. So far as I can learn, it has beaten all phosphates producing wheat and corn in this country; and, as an evidence of the standing of Star Bone Phosphate in this country, you will find our sales, as far as I can learn, very large, as I am having inquiries every day. In fact, it is the leading phosphate in this country.

FRANCIS H. HARPER.

J. M. Laroque's Anti-Bilious Bitters.—If you feel dull, drowsy, debilitated, have frequent headache, mouth tastes badly, and tongue coated, you are suffering from torpid liver or biliousness, and nothing will cure you so speedily or permanently, as J. M. Laroque's anti-bilious bitters. 25 cents a paper, \$1.00 a bottle. For sale by W. E. Thornton, sole proprietor, Baltimore and Harrison streets, Baltimore.

Ayer's Ague Cure is the only remedy known, which is certain to cure Fever and Ague permanently, by expelling the malarial poison which produces the disease. It does this surely, and leaves no ill effects upon the system. Nothing is so thoroughly depressing and discouraging as the periodical return of the alternate chills, fever and sweating, peculiar to this disease.

Our Western people are liable to be laid low, by malarial fever, when breaking up new lands. The folks in the East are also complaining of fevers, chills and agues, arising from decaying vegetable matter and imperfect drainage. For either East or West the best remedy is Ayer's Ague Cure.

Ah! you have a headache! Why don't you try Ayer's Pills? They will relieve the stomach, restore the digestive organs to healthy action, remove the obstructions that depress nerves and brain, and thus cure your headache permanently.

Baltimore Markets—Sept. 3.

Live Stock.—*Beef Cattle.*—The market has been extremely slow to-day throughout, and prices ¼¢ lower than last week. We quote at \$2.50 @ \$6.00. Most sales were at \$4.25 @ \$5.25 per 100 lbs. *Pigs.*—Priced remain unchanged since Monday, quality considered, at 7½¢ @ 8¢ per lb. net, and trade has been fair at these figures. *Sheep and Lambs.*—There have been no fresh arrivals since Monday. Trade has been slow and prices unchanged. We quote butcher sheep at 3½¢ @ 5¢, and Lambs at 4½¢ @ 6¢ per lb. gross.

Tobacco.—*Leaf.*—The arrivals of Maryland continue liberal, and the market is active and firm. There is a good inquiry for Ohio, and the market is firm for all grades. We quote; Maryland inferior and frosted, \$2.00 @ \$3.00; do. sound common, \$3.50 @ \$5.00; do. good common, \$5.50 @ \$6.50; do. Middling, \$7.00 @ \$8.50; do. good fine red, \$8.50 @ \$11; do. fancy, \$12 @ \$14; upper country, \$8.50 @ \$10; do. ground, \$4.00 @ \$6.00; Ohio inferior to good common, \$4.00 @ \$6.00; Greenish and brown, \$5.00 @ \$7.50; do. medium to fine red, \$7.00 @ \$10; common to medium, spangled, \$7.00 @ \$10.00; do. fine spangled and yellow, \$11 @ \$16; do. air-cured medium to fine, \$6.00 @ \$14.00.

Flour.—Stocks are moderate and holders are not at all uneasy, but the demand is restricted to buyers' urgent wants, and the market is quiet but steady. We quote as follows: Howard street and Western Super, \$3.00 @ \$3.75; do. Extra, \$4.00 @ \$5.00; do. family, \$5.25 @ \$6.00; City Mills Super, \$3.00 @ \$3.75; do. Extra, \$4.00 @ \$4.75; do. (Rio Grande) Extra, \$6.00 @ \$6.25; Baltimore Winter Wheat Patent, \$7.50; do. High Grade Family, \$6.75; do. Second Grade Extra, \$6.50; do. Third do. do., \$6.25; Fine, \$7.75 @ \$8.00; Rye Flour, \$3.75 @ \$4.00; Corn Meal, per 100 lbs., \$1.30 @ \$1.35.

Wheat.—Southern Wheat is quiet and easier for shipping grades, of which there is a more liberal offering. Choice milling grades are comparatively scarce and rule steady. Common and tough parcels sold at 95¢ @ 110¢, good to choice Fall at \$1.13 @ \$1.15½; and do. long berry at \$1.16 @ \$1.19. The market for Western Wheat is inactive but steady, closing dull. The closing quotations were as follows: Spot No. 2, \$1.15 @ \$1.15½; September, \$1.15 @ \$1.15½; October, \$1.17 @ \$1.17½; and November, \$1.19 @ \$1.20.

Corn.—The supply of Southern white Corn is more limited, and the market is easy, with sales of inferior at 37¢, and of good at 61¢. Yellow is about steady at 61½¢ @ 62¢, for good to prime. Little or no business is doing in Western Corn, and the market continues dull and nominal. The closing prices were: 59½¢ @ 60½¢, for spot, 60½¢ @ 61¢, for September, and 60½¢ @ 61¢, for October.

Oats.—The market holds quiet but firm, holders generally insisting on higher prices. We quote Western White, new, 30¢ @ 33¢; Western Mixed, new, 32¢ @ 35¢; Pennsylvania, new, 35¢ @ 38¢; Maryland and Virginia, new, 30¢ @ 33¢.

Rye.—There is quite an active inquiry, and sales were of prime new Maryland at 67¢.

Cotton.—There is no pressure to sell, and the market is quiet but steady, with indifferent demand and no recent sales. We quote as follows: Middling at 10½¢ @ 10½¢, low middling at 9½¢ @ 9½¢, and good ordinary at 8½¢ @ 8½¢.

Provisions.—Speculation is dull and lower, but the local order trade is fairly active and prices are unchanged. Packed lots from store are quoted as follows: Bulk shoulder 7½¢; clear-rib sides, 8¢; Bacon shoulders, 8½¢; clear-rib sides, 9¢; Hams—Sugar-cured, 15½¢ @ 16½¢; Refined Lard, in tierces, 10½¢ cts. Mess Pork—New heavy, \$15 @ \$16.

Butter.—There is a brisk demand for strictly choice stock and the market is firm, with light supply. Medium and lower grades are dull and nominal. We quote choice New York State at 21¢ @ 23¢; cream Western choice at 14¢ @ 15¢; do. good to prime at 13¢ @ 15¢, and hear-by receipts at 10¢ @ 14¢ cts. ½ lb.

SEED WHEAT!

NEW VARIETIES OF GREAT PROMISE!

HYBRED MEDITERRANEAN—Cross between **DIRTY** and **RED MEDITERRANEAN**, combining the hardiness and prolificacy of the former with the flouring quality of the latter. Bearded; red chaff. Withstood last winter better than **Clawson**. Have counted 72 heads on one stool. DOES NOT RUST. Price, \$15.00 per bushel, \$4.00 per peck (not prepaid). \$1.00 per pound, prepaid.

MARTIN AMBER—Has taken **FIRST PRIZE THREE TIMES** at Pennsylvania State Fair, Bushel, \$6; peck, \$2; 3 lbs., \$1. Also pure strains of **Velvet Chaff**, **Clawson**, **Fultz**, **Red Mediterranean**, etc. \$2 to \$3 per bushel.

HIRAM SIBLEY & CO. ROCHESTER, N. Y. CHICAGO, ILL.

FARMERS who are interested in Growing Crops

cheaply and successfully should write us for our pamphlet on pure fertilizers. A good fertilizer can be made at home for about \$12 a ton by composting with **POWELL'S PREPARED CHEMICALS**. References in Every State. Agents wanted for unoccupied territory. Apply with references.

BROWN CHEMICAL CO.

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Bone, Potash, Ammonia, &c.

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ALSO 20 Breeding Ewes from the Best Strains of Henry Webb and Lord Washington for Sale by **SAM. J. SHARPLESS**, 705 Walnut St., Philadelphia.

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We are prepared to make low rates on large lots for Fall Trade. THOSE WANTING 5,000 to 10,000 WILL PLEASE CORRESPOND WITH US. We have **BARTLETT** and **KIEFFER** PEAR, **CHAMPION** and **ORANGE QUINCE**, **REED** PLUM, **APPLE** and **CHERRY** TREES, and **SMALL FRUITS** in great variety.

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KIEFFER 100,000 PEACH TREES All best varieties of new and old Blushes, Currants, Grapes, Raspberries, etc. **EARLY CLUSTER** New Blackberry, early, hardy, good. Single hill yielded 13 quarts at one picking. Send for Tree Catalogue. J. S. COLLINS, Moorestown, N. J.

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To further the ENORMOUS sales of Beatty's Cabinet Organs during the month of August, and until September 15, 1885, midnight, the following Special Offer is made, namely: If any reader of this newspaper will clip the following notice or coupon and remit it promptly, together with only \$49.75 in cash, by Post Office Money Order, Registered Letter, by Check or Bank Draft, on or before September 15, 1885, I will box and deliver on board cars here the following described PARLOR ORGAN, with Bench, Book and Music, the regular Catalogue Price being \$107.75. I desire this beautiful Cabinet Organ introduced without moment's delay, and to those who will order this Organ within seven days from date of this newspaper, a further deduction of \$2.00 will be allowed, making the instrument cost in all only \$47.75. My sole object is to have the organ introduced without delay, thereby securing your good will in your immediate vicinity, as further sales are sure to follow at the regular catalogue price, \$107.75. Be sure to clip the following notice or coupon and mail it to me with your order.

This notice or coupon, if returned to DANIEL F. BEATTY, Washington, New Jersey, from any reader of the AMERICAN FARMER, on or within the time specified as above, together with \$49.75 in cash, entitles holder thereof to one Beatty Organ, No. 60, as specified. Money to be promptly refunded, with interest at 8 per cent., if the organ is not just as represented after one year's use. DANIEL F. BEATTY.

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Order now. Nothing saved by correspondence. What I desire is to sell you an organ—the instrument speaks for itself. It sings its own praises. Every organ sold tells others in the same community. If you are unable to accept this great offer, please write me your reasons why. I want to hear from you anyway. When you order be very particular to give name, post-office, county, State, freight station and on what railroad. Always be sure to remit by P. O. money order, registered letter or bank check. I desire this magnificent instrument introduced without delay, and all orders must positively be given within time specified to secure this great offer. All who order within seven days from date of this newspaper remember a further deduction of \$2.00 is given. Address or call upon the Manufacturer.

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Round Trip Tickets from Baltimore, including Admission. 50 CENTS.

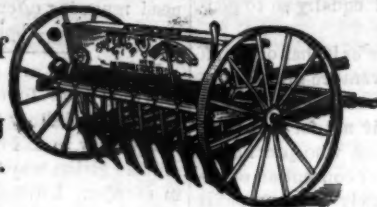
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The "SUPERIOR" will be furnished this Season with the "MARK'S FERTILIZER FORCE FEED," as well as our OLD RELIABLE FERTILIZER ATTACHMENT. The "SUPERIOR" is now offered to the public with

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And, from the reputation it has so justly earned, it is fully entitled to the name of "SUPERIOR." Send for Circular and Price List. We also have the Stover Corn and Cob Mill, the only Geared Sweep Mill in the Market. Also Buckeye Cider and Wine Mill and Agricultural Implements generally. Send for descriptive Circular and Price List.

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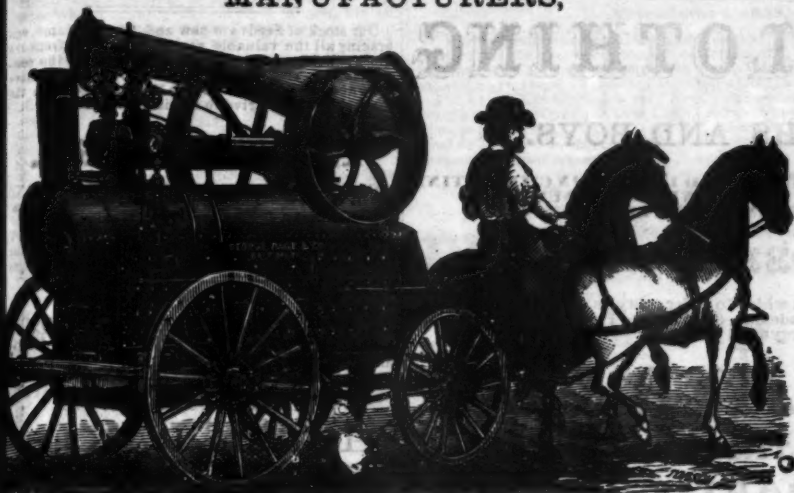
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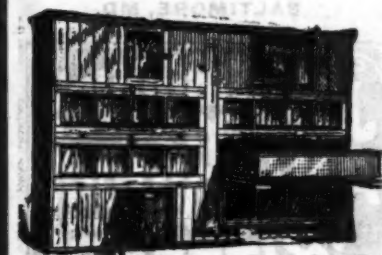
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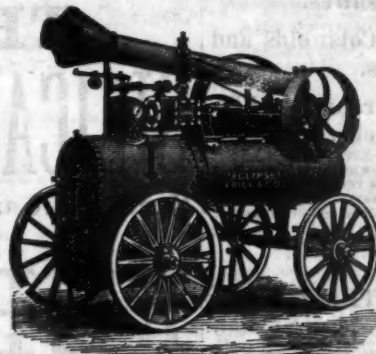
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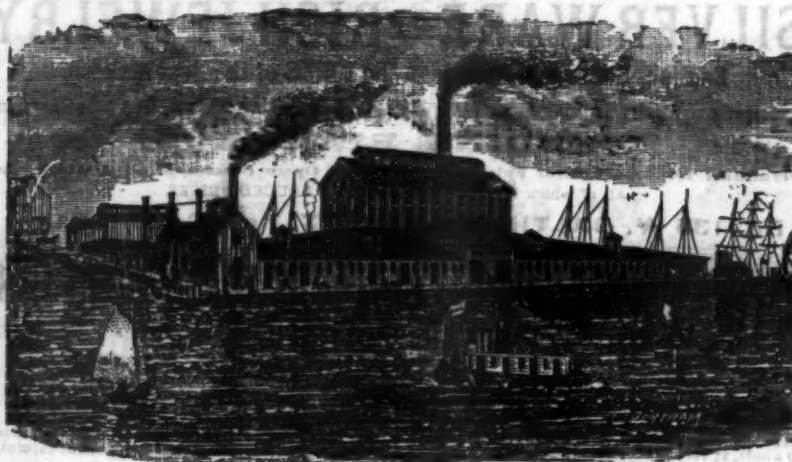
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